THE LIFE AND WORK OF ASTLEY COOPER

This book is protected under the Berne Convention. It may not be reproduced by any means in whole or in part without permission. Application with regard to reproduction should be addressed to the Publishers.

Astley Paston Cooper

This portrait is a reproduction of the engraving by Cousins after the painting by Sir Thomas Lawrence. The original is in the Council Room at the Royal College of Surgeons. It was subscribed for by his pupils in 1812 when Sir Astley was forty-six, but was not finished until some years later.

[Frontispiece

THE LIFE AND WORK OF

ASTLEY COOPER

By

R. C. BROCK, M.S., F.R.C.S., F.A.C.S.

Surgeon to Guy's Hospital; formerly
Astley Cooper Student, Guy's Hospital

E. & S. LIVINGSTONE, LTD
EDINBURGH AND LONDON
1952

Dedications are often conventional or pointless, but this book, being about Astley Cooper, demands one. It is dedicated to what was perhaps dearest to his heart, GUY'S HOSPITAL AND ITS MEDICAL SCHOOL.

MADE AND PRINTED IN GREAT BRITAIN
BY WILLIAM CLOWES AND SONS LTD, LONDON AND BECCLES

PREFACE

I HAVE long been interested in and admired the work of Sir Astley Cooper, and in 1941, as editor of the *Guy's Hospital Reports*, I decided that it was fitting that the centenary of his death should be commemorated by the issue of a special number dedicated to him. This volume dealt chiefly with arterial surgery as this was one of his chief interests and a field in which he made some of his greatest contributions. The publication of this number involved much reading and research among his writings and in matters connected with him, and I was soon impressed with the fact that, great as his reputation is, he has not received the recognition which he really merits. To many he is little more than a great name; some remember him for his glittering worldly success; to others he is the man who removed a sebaceous cyst from the head of George IV and was made a baronet for this service. The last is perhaps the most trivial memory as it implies an easy rise to eminence. He was, of course, selected to perform this operation, a small one but of great danger and responsibility in the pre-antiseptic days of surgery, and received the honour for its success, because he was already such a great, commanding and successful figure as a surgeon. Indeed the king insisted that he should do the operation in place of the already officially appointed royal surgeons.

Even surgeons who are familiar with surgical history do not know the full extent and value of his work and contributions. This is because he has received rather scanty and only intermittent notice throughout the years, in contrast, for instance, to his great predecessor, John Hunter, whose life and work is constantly before us and is biennially reviewed in the Hunterian Festival at the Royal College of Surgeons. It seemed, therefore, that the time had come for a new appraisal and presentation of his life and work. It is true that Bransby Cooper, in 1843, published his well-known and standard two-volume biography. This is a mine of information about Astley Cooper, especially in regard to such personal matters on which only his contemporaries can enlighten us. The book is, however, rather long and at times tends to be tedious in the manner of some of the Victorian biographies, and few people read it to-day. Moreover, the appraisal of the value of a man's work by his contemporaries, and especially his immediate associates and more especially by a nephew, is liable to lack the perspective that time alone can give.

Hence this new biography which, although it inevitably contains much material and information from Bransby Cooper, is an attempt at a modern presentation of Astley Cooper's life and work and assessment of the value of his contributions.

It is inevitable that a close study of the work, writings and achievements of a great man by a biographer should engender a degree of admiration that may at times appear to others to be excessive. It may be felt that I have been unduly laudatory of Astley Cooper's work and achievements. I do, however, feel sincerely that he has not received that acknowledgement which he deserves; that in great part this is due to simple ignorance of his work and achievements. I have, therefore, striven both as a surgeon and as a Guy's man to do justice to the work and memory of the greatest of Guy's surgeons.

This biography was written in 1941, but the conditions then prevailing did not make publication feasible and hence its appearance has been delayed eleven years.

It grieves me that I am able to pay only a posthumous tribute to Professor J. A. Ryle, who so kindly and ably went through the earlier manuscript for me and made many valuable suggestions.

My thanks are also due to Mr. W. R. LeFanu, Librarian to the Royal College of Surgeons, and to Mr. G. A. R. Winston, Wills Librarian at Guy's Hospital, for valuable help in preparing the bibliography of Astley Cooper's writings.

R. C. B.

January, 1952.

CONTENTS

CHAPTER PAGE

PREFACE v

I. PARENTAGE AND BOYHOOD 1

II. APPRENTICESHIP AND EARLY ACHIEVEMENTS . . 4

III. THE YEARS OF PROFESSIONAL DEVELOPMENT . . 11

IV. SURGEON TO GUY'S HOSPITAL 20

V. HIS DAILY WORK 28

VI. FINAL YEARS AT BROAD STREET AND HIS MOVE TO THE WEST END 32

VII. ASTLEY COOPER THE PRACTITIONER. . . . 38

VIII. THE SURGEON 44

IX. ASTLEY COOPER AND ARTERIAL SURGERY . . . 49

X. AMPUTATION AT THE HIP-JOINT 66

XI. PUBLICATIONS 72

XII. PUBLICATIONS (continued) 86

XIII. LECTURER AND TEACHER 100

XIV. A LECTURE BY ASTLEY COOPER 113

XV. ASTLEY COOPER'S MUSEUM AND SPECIMENS . . 121

XVI. RETIREMENT FROM HOSPITAL WORK; THE FOUNDING OF GUY'S HOSPITAL MEDICAL SCHOOL . . . 131

XVII. RECREATIONS AND AMUSEMENTS 140

XVIII. JOHN HUNTER AND ASTLEY COOPER . . . 145

XIX. THE MAN AND HIS PERSONALITY 151

XX. THE FINAL SCENE. 161

XXI. THE WORK GOES ON; THE ASTLEY COOPER STUDENTSHIP 164

BIBLIOGRAPHY 169

REFERENCES 173

INDEX 174

LIST OF ILLUSTRATIONS

PLATE FACING PAGE
Engraving of Lawrence's Portrait of Sir Astley Cooper . . . . . . *Frontispiece*
1 Guy's Hospital in 1799 24
2 Certificate Issued by Henry Cline and Astley Cooper 25
3 Specimen to show Collateral Circulation after Ligation of External Iliac Artery . . . 54
4 Ligation of Aorta in a Dog 56
5 Edward Osler's Letter giving his Account of the Operation of Ligation of the Aorta in Man . 57
6 Specimen of Ligation of the Aorta in Man . . 58
7 Lithograph of Patient after Amputation at the Hip-Joint 70
8 Illustrations to show Transversalis Fascia, the Abdominal Ring and the Femoral Sheath . 72
9 Reduction of Dislocated Shoulder . . . 88
10 Injected Specimen to show the Blood-supply to the Head and Neck of the Femur 89
11 Thymus from Foetal Calf 94
12 Cooper's Suspensory Ligaments of the Breast . . 97
13 Autographed Title-page of Astley Cooper's Last Book 99
14 Portion of Napoleon's Intestine 128

CHAPTER I

PARENTAGE AND BOYHOOD

ASTLEY COOPER, like so many of our country's great men, was the son of a country clergyman, his father being rector at Brooke in Norfolk. Here Astley Cooper was born on August 23rd, 1768. He was the fourth son and sixth child, and was followed by one more son and three more daughters. All the daughters died of tuberculosis, only two of them even reaching adult life. The youngest son also died of tuberculosis soon after he was married; but the remaining four sons escaped the disease, although it is perhaps significant that the second, Samuel Lovick, died of "water on the chest" at the age of 54. Samuel Lovick was the father of Bransby Cooper, Astley Cooper's biographer and his successor as surgeon on the staff of Guy's Hospital.

The family was well known in Norfolk, and from his father's and his mother's side Astley inherited certain intellectual qualities which must have played an important part in forming and developing his character and ability. His mother, a descendant of Sir Isaac Newton, was a talented and charming woman. She was a successful authoress in a small way who first wrote some story-books for children and later four novels. His father also wrote many pamphlets and articles, chiefly on political and religious subjects, which brought him some reputation.

Astley's paternal grandfather was a surgeon at Norwich and also a man of considerable literary attainments. His uncle, William Cooper, was senior surgeon to Guy's Hospital. It will thus be seen that his early influences and connections were very favourable to the development of a successful career.

Unlike his brothers, two of whom took a degree at Cambridge, he was no scholar and in fact did not go away to school. He received lessons at home from his father and mother and the village schoolmaster, and seems to have been indifferently interested. His father said of him: "He is a sad rogue, but in spite of his roguery I have no doubt he will yet be a shining character."

He was left to run rather wild and soon became the admitted leader of the local country boys. Bransby Cooper tells a number of rather dull stories of his boyhood scrapes and escapades, most of which were madcap and daring, and not a few nearly ended in tragedy.

One dramatic story has often been told; it is that he saved the life of his foster-brother, who was bleeding to death from a lacerated wound of the thigh, by the timely application of a handkerchief for a tourniquet. Bransby Cooper makes a great deal of this and states that after the accident the boy was carried to his home in a sinking condition; all was confusion and only the young Astley Cooper kept his head. Taking a handkerchief he tied it tightly round the limb above the wound so that it controlled the bleeding while a surgeon was being sent for from London. By this act it is said that he saved his foster-brother's life.

This story has been copied from one book or article to another and is retold in almost every reference to his early life. It is difficult, however, to see how Bransby Cooper came to sponsor the story when his uncle used to describe quite clearly in his lectures the correct details of the incident. Speaking of wounds of the popliteal artery, he says:

> It was a case of this accident which first attracted my attention to surgery, and which taught me its value.
>
> A foster brother of mine, named John Love, aged about thirteen years, was playing and fell, as a waggon was passing, and one of the wheels of the waggon went over the back of his knee, as he lay with his face to the ground. The waggon was stopped, and when he was drawn from under it, a stream of blood directly burst from his ham; a handkerchief was tied tightly over the wound, and he was put upon the waggon, and was carried home in a fainting state. Different surgeons in the neighbourhood were sent for; but when they heard the nature of the case they all made excuses; one had a most dangerous case of fever, another was at a labour; a third with a pressing case of inflammation of the bowels; they were all engaged and could not come. . . .
>
> Tired of waiting, an old woman (who was deemed a sorceress in the village) was applied to, and she sent back the messenger, saying, that the bleeding would be stopped by the time they returned; and so it was, for John Love had expired.
>
> This seems to have made a strong impression upon my mind, as it was

> the first death I had witnessed, and I was directly convinced how valuable a member of society a well informed surgeon must be, and how great a curse an ignorant surgeon was.

This incident directed his thoughts towards surgery, and one more incident also influenced him. In his own words:

> It was at the Norfolk and Norwich Hospital that I first saw Mr. Donnee operate (for stone) in a masterly manner, and it was this which inspired me with a strong impression of the utility of surgery, and led me to embark in it as my profession.

No doubt he was also influenced by listening to the conversation of his uncle, William Cooper, then senior surgeon to Guy's Hospital, who was an occasional visitor to the rectory. His uncle's position and influence also offered certain obvious advantages if he followed the same profession.

It has been said that he was apprenticed to surgery somewhat in despair in the slight hope that he might make some good at it, since he seemed to have no inclination for any other useful work. This is almost certainly not true for by his own statement he was definitely and positively attracted to surgery as a career. At any rate, when he expressed a wish to be trained as a surgeon, his parents were only too glad to agree to the suggestion and he was accordingly apprenticed to his uncle for the usual term of seven years. He left home to begin work at Guy's Hospital in August 1784 when he was just sixteen years of age.

CHAPTER II

APPRENTICESHIP AND EARLY ACHIEVEMENTS

IT is necessary to explain that the two hospitals of Guy and of St. Thomas, in addition to being situated opposite one another in St. Thomas's Street, were closely connected in working. For many years they were known as the United Hospitals and until 1825, when quarrels arose which ended in the formation of a separate medical school at Guy's, the students of both institutions were allowed to attend the practice and teaching of surgery at both hospitals. The routine lectures in medicine were delivered at Guy's; the lectures in surgery and anatomy were given in the lecture theatre at St. Thomas's.

It was not convenient for Astley Cooper to live in his uncle's house and so it was arranged that, while articled to his uncle at Guy's, he should live with Mr. Henry Cline, surgeon to St. Thomas's Hospital. This association was to be of great importance to Astley and possibly affected the whole course of his career. He would not have got on well with his uncle if they had lived in the same house, for their characters and ways had little in common, and his uncle's roughness of manner and strict sense of discipline would not have found a ready response in Astley. Cline, on the other hand, had a most beneficial and fortunate influence on him. He was a younger and more talented man, then only thirty-four, his conversation was stimulating and instructive, and he was one of the best surgical operators of his day. Astley Cooper was indeed fortunate to come under his guidance, for if at this unformed stage of his career he had been supervised by someone less gifted and industrious he would not have been stimulated to work so well and consistently as he did, and his whole training and future might have been affected.

No less important was his early introduction to the principles and teaching of John Hunter, for whom Cline had a great admiration. Few surgeons of that day thought good of Hunter and many were consistently derogatory of his teaching. William Cooper, for instance, said that he never could understand him and usually went to sleep at his lectures. Cline thought differently, and it was fortunate that Astley Cooper was not only taught to admire Hunter but also heard the details of his work and teaching. He was soon to be a regular attendant at Hunter's lectures. There can be no doubt that Hunter and the Hunterian tradition were the great inspirations of Astley Cooper's life and work, as will be seen as his story is told.

There is a curious resemblance between the early days of the two men. Although Cooper received a good education at home it was definitely wanting in many things owing to his own lack of interest. Hunter was almost illiterate up to the age of seventeen. Astley Cooper was, however, exposed to refining influences at home, whereas Hunter, in his youth, was the associate of rough and coarsening companions. Hunter's first months in London were spent in dissipation until he pulled himself together and embarked upon his life work; Cooper similarly started off by sowing his wild oats. He was a youth of handsome bearing and attractive personality, and, falling in with associates of his own standing, he proceeded to have a good time—much to the anxiety of his relatives and friends, who feared that he would prove to be no more inclined to sustained and serious work in London than he had been in Norfolk. This phase lasted for only a few months and he then settled down to a study of his profession with an enjoyment and zeal that never afterwards dimmed. He rapidly became a brilliant and outstanding student, his intelligence and industry being enhanced by his handsome and pleasant bearing and his likeable nature.

He soon made up his mind that being articled to his uncle was unsatisfactory and asked to be transferred to Mr. Cline. This was agreed, and six months after his arrival in London, that is at Christmas 1784, the transfer took place. He continued to attend his uncle's hospital teaching and rounds and, although they had their differences, his uncle was warmly attached to him and fully appreciated his merits and capabilities. It was on his uncle's nomination that he was elected a member of the Guy's Hospital Physical Society at the beginning of his first session. This, the oldest medical society in London, was the precursor of the present Pupils' Physical Society. New members were expected to present a paper during their first session, and Astley Cooper delivered one on cancer of the breast; this condition interested him throughout his whole professional life. His last book, on the anatomy of the breast, was intended to pave the way for a book on malignant disease of the breast, and he was actually working on this at the time of his death. He was not very interested in the Society during his first session, for he was fined fifteen times for non-attendance. In the next year's session he entirely changed and thereafter was one of its most constant and enthusiastic supporters.

He received other influences during his stay in Cline's household, apart from purely professional ones. Cline's mother was a talented and educated woman and Astley learned much from his contacts with her. The first volume of his work on *Hernia* was dedicated to his "Master in Surgery, Mr. Cline", and in the dedication he gratefully acknowledges his indebtedness to the good influence of Cline's household. Cline himself was enthusiastic about the new principles of democracy which later culminated in the French Revolution, and from visitors to his house of like political leanings and from Cline's constant and earnest conversation on the subject, Astley Cooper became an ardent follower. These influences were, at a later date, nearly to mar his whole career. Fortunately, after discussion with his friend Coleman, he abandoned all political interests as he felt they were incompatible with the proper prosecution of his chosen profession.

Astley Cooper returned to his second year with the fixed intention of occupying himself seriously and entirely with his work. He seems to have realised the great and fundamental importance of a sound knowledge of anatomy and spared no pains to master the subject. Not only did he spend long hours on dissection and study, but he soon became a kind of unofficial demonstrator, and was constantly being appealed to by the pupils for help and teaching. This was partly due to the unpopularity of the official demonstrator, Haighton, and partly to Astley's charm of manner and eager willingness to impart his knowledge. This demonstrating was of great assistance to him, as any student-demonstrator of to-day will appreciate; the extra dissection gave him not only greater familiarity with the body but also improved his technical skill; the constant repetition of difficult anatomical points impresses them for ever.

His friend Holland says that Cline's lectures in surgery and anatomy became so popular that the number of students in the dissecting-room crowded it so as to make it uncomfortable. Astley did not like this, and as he began to find that he was being constantly distracted there and really felt the need of dissecting seriously and quietly for his own benefit, he suggested that he and Holland should take their parts over to their rooms at Cline's house where they were both living. This they did for the whole of the rest of the session, using their sitting-room as a dissecting-room! Holland also tells how, even at this early time, Astley, in his eagerness to make *personal* observations in anatomy and physiology and not to rely upon books, made many experiments on living animals. In one he tied the femoral and brachial arteries in a dog and later sacrificed it so that it could be injected and dissected in order to study the collateral circulation.

His scant interest in the Physical Society during his first year has been mentioned. During the second year he made up for this and threw himself into the activities of the Society with just the same spirit in which he attacked his daily studies. At the beginning of the session he was elected a member of the managing committee, and during the whole session he missed but one meeting. He also attended some of the meetings of the society at John Hunter's and, Holland tells us, often took an active part in the discussions, when "the pertinence of his remarks, aided by his striking figure and fine voice, joined to the eagerness with which he entered into the subject, procured him marked attention".

Although in addition to his anatomical studies and experiments he was attending Cline's clinical instruction and writing notes on his cases, Astley also found time to attend a course of lectures given by John Hunter himself. Hunter was a poor lecturer; his presentation was devoid of method and was irksome to most listeners. This was not only because of his delivery but also owing to the obscurity of his language. Hunter learnt from no man; but from his own observations, studies and meditations delivered his ideas in a language almost his own. In spite of this Astley realised the essential merits of his discourse and worried out his meaning by discussing the lectures with his friends Holland and Coleman, and impressed them in his mind by doing many experiments himself to confirm them. "It was not long before he felt the superiority which the attention he had devoted to these lectures gave him."

In the spring of his third year (1787) Astley Cooper nearly died from an attack of typhus. A man who was known to his parents in Norfolk was lying under sentence of death in Newgate, and Astley visited him and caught the infection from him. He survived only after much careful attention and spent the summer convalescing in Yarmouth, where his parents were then living. Provision had been made in his indentures as an apprentice to allow him to spend one session in Edinburgh, and in the autumn after his recovery from this illness he decided to avail himself of the arrangement; in the October of 1787, the beginning of the fourth year of his studies, he went to Edinburgh. It was a most happy and profitable visit. He learnt much, made many lifelong friends, learnt to admire the work of several of the professors, especially Monro (secundus), and was popular with everybody. He was a constant visitor at the meetings of the Royal Medical Society, and the esteem in which he was held is shown by an offer to make him President if he should pay another visit to Edinburgh. He was actually made president of a students' society. In addition to the general broadening influence that this visit had upon him, it seems that Astley Cooper found for the first time the real value of what he had learnt by his hard studies. This was noticeable not only in his knowledge of anatomy but also in his clinical training; his skill in diagnosis, learned from his able teacher Henry Cline, put him far ahead of other students of the same age. Although he found that the standard of surgery in the London hospitals was superior to that taught in Edinburgh, he learnt from Edinburgh an orderly and systematic method of examining and of considering the diagnosis and treatment of his cases which he retained throughout his life and to which he attributed much of his brilliant clinical success.

After his seven months' stay in Edinburgh he spent a holiday touring the Highlands and the Western Isles and then returned to London for the beginning of his fifth year. He himself naïvely records:

> When I returned to London I found that I had learned much during my absence. Big with my own importance, I became presumptuous; but was soon taken down by Newell, Shrapnell and others in the Physical Society.

Fortunate in so many things, he was equally fortunate in his fellow apprentices at Cline's house; Holland has already been mentioned, and about this time came one who was to be Cooper's lifelong friend. He was Edward Coleman, who later became a distinguished veterinary surgeon and founder of the Veterinary College. It was due to Astley Cooper's later influence with William IV that it gained the distinction of adding "Royal" to its title. Coleman was the man who first raised veterinary surgery to the character of a science in this country, and in his own speciality became as distinguished as Astley Cooper did in his. Cooper's intimacy with him was of great mutual benefit and they shared their studies both by discussion and common experiment. Cooper writes: "We made the experiments together, which were published in his work on Respiration." They also went to Hunter's lectures and "this was exceedingly improving, as we day by day debated all the way home on his doctrines". Cooper seems to have been a constant attendant at Hunter's lectures for several years.

Nothing is known of the details of his work during the remaining years of his apprenticeship, that is until 1791, except that at some time during this period, probably in 1789, he was appointed demonstrator in anatomy at St. Thomas's Hospital in place of Haighton. This post, together with his ordinary studies, must have occupied his time fully and there can be no doubt that he made every use of his opportunity. He was a popular, skilful and successful demonstrator.

In 1791, just before his pupilage ended, Henry Cline took a step which shows he thought highly of Astley Cooper's attainments and proven industry and that it would be of benefit to the Schools to retain him. He asked him to share his lectures with him and the offer was at once accepted. Astley Cooper was to give a part of the lectures and demonstrations, and Cline agreed to pay him £120 per annum, this sum to be increased by £20 a year until he gave one half of the lectures when he should receive half the proceeds.

This appointment was naturally a great achievement for him and marks the end of his pupilage and the start of his professional career. From this day his course was one of almost uninterrupted march from success to success, due entirely to his own genius, personality and industry.

Haighton, who was much senior to Astley Cooper, felt slighted by being passed over for a young apprentice in the appointment to a lectureship and took no pains to conceal his feelings. He was sufficiently highly thought of not to be overlooked and was later appointed obstetric physician and lecturer in physiology to Guy's Hospital. Although he always admired and respected Astley Cooper he was always ready to taunt and dispute with him, and the Physical Society meetings in later years apparently saw much of this acrimony.

Here we leave Astley Cooper the apprentice, now a young man of twenty-three, on the very threshold of his brilliant career, with a record of seven years of hard work and success behind him and before him a long life of even greater success and professional achievement which was to carry his name and fame throughout the world, was to establish Guy's Hospital as a famous school of surgery, and was to give him the immortality that belongs to the select band of really great surgeons.

CHAPTER III

THE YEARS OF PROFESSIONAL DEVELOPMENT

SOON after his arrival in London to begin his studies Astley Cooper had been introduced to a wealthy merchant, Mr. Cock, who was a close friend of Cline's. Cooper became a frequent visitor to his house and eventually fell in love with his only daughter. Towards the end of his pupilage they became engaged, and as soon as his apprenticeship was finished they decided to be married. The wedding had been arranged for November 21st, 1791, but unfortunately the bride's father, who had been ill, died on this very day and the ceremony had to be postponed. At the suggestion of their friends, as all the arrangements had been made, the wedding was not long delayed but took place quietly and inconspicuously in December. Actually the young couple went to church as members of a christening party from Cline's house and then stayed on and were married. In this way no news of the wedding reached the hospital and Astley Cooper delivered his evening lecture as usual, no one being aware of the great event.

He and his young wife lived in Jefferies Square in a house that had been bought and furnished for them by her father. As they also received a fortune of £14,000 and Astley Cooper had in addition the income from his lectureship, it will be seen that they were comfortably off and he had no financial anxieties to consider in planning his work. Some men might have had ambition killed by these easy circumstances but he was too great a man for this. He looked upon his fortune merely as a means to allow him to concentrate on the advancement of his professional work, without the distractions that private practice would entail. He determined to devote his whole time to his hospital work and lectures and not to engage in practice for three years.

Mrs. Cooper was a shy and retiring but attractive lady, possessed of intelligence and good sense. She was a good housekeeper and made her young husband happy and comfortable as he himself enthusiastically reported to a mutual friend. In the summer after their marriage he and his wife determined to visit Paris as neither had been to the Continent. This was the summer of 1792 and they arrived in the city in June, just when the political situation was working up to the climax of the September massacres. Although he wished to go primarily to study the work and teachings of the great French surgeons he was also attracted by the knowledge that he would be able to see at first-hand something of the working of the political principles which had long engaged his interest since being at Cline's house. He was certainly to get his fill of this!

In addition to attending the lectures and operations of Dessault and Chopart, he attended the meetings of the National Assembly where he heard Danton, Marat, Robespierre and others address the Assembly. He was actually watching Chopart operating when the first cannon was fired on August 10th. In his own words he describes the scene of confusion, destruction and slaughter he witnessed and how on the way home he was twice assailed as being an aristocrat. He found his wife much alarmed, and perhaps reasonably so as at this time she was carrying her first baby.

From the windows of their hotel they watched death and destruction march the streets.

> In the evening the gardens of the Tuilleries were full of dead men, and they lay naked, having been stripped of all their clothes by the mob.
>
> On the next day Ann and I went to the Hotel d'Espagne, and passed through the mob, which were escorting Louis XVI and his queen to the Temple. The cruelties committed now became more frequent; but the reign of terror was never more full of horror than on the morning of the 2nd of September, when the prisoners of the Abbaye were murdered by the infuriated populace, led on to the bloodthirsty act by Robespierre and his associates.

This event seems to have horrified and disgusted him; his wife's condition and her continued state of alarm, coupled with the daily peril of their existence in the stricken city, for on many days they dare not even leave their hotel, made him decide to return home. After some difficulty he at last managed to secure a passport and they left Paris in the middle of September. Truly a memorable visit!

On his return home he threw himself wholeheartedly into his work. As mentioned above he had determined not to seek private practice, but he offered to see non-paying patients at his house early in the morning. This he did in order to increase his clinical experience and many of the local poor attended and received free medicine from him. Cases of surgical or teaching interest he would get admitted to the Hospital. He says:

> For three years after my apprenticeship expired, I did not seek business, but devoted myself to the study of my profession, and to teaching the students entirely. My industry at this time may be gathered from the following circumstances.
>
> I went to the hospital before breakfast to dissect for lecture. I demonstrated to the students before. I injected their subjects. I lectured from two o'clock till half past three. In the evening, three times per week, I lectured on surgery. I attended to the interesting cases in the Hospital, making notes of them, and in this latter practice I always persevered.

The courses in anatomy and surgery had always been given together; Cooper felt that this was not a satisfactory arrangement and he eventually managed to persuade Cline to allow the two subjects to be dealt with separately. This was no mean change for a young man to make and it says much for his capabilities that Cline was willing to agree with him.

He had no difficulty with the lectures on anatomy, but the planning and delivery of the surgical lectures occupied much of his time and thought.

His first course of lectures was almost a failure; they were much too theoretical and dealt with first principles after Hunter's teaching in a way quite unsuitable for most of his class, who were pupils from the provinces and the country where they had been apprenticed to doctors of the old school. Most of Hunter's expressions which he used were quite unintelligible to them and his talk was mostly above their heads; its failure was reflected in the poor entry of students for his second course of lectures. This caused him great anxiety and disappointment, but he quickly realised the cause of his failure and at once set to remedy it.

In his next course he no longer dealt with unattached general principles, but introduced cases from the hospital wards to serve as texts for his discourse. He would select patients suffering from disease or accident which had a bearing on the subject of his lecture. For a lecture on acute inflammation he would show cases of erysipelas or abscess, and after describing and discussing them he would proceed to a consideration of the relevant morbid anatomy and pathology, and would then discuss the principles of treatment that naturally followed, and finally the practical elements of treatment. His remarks would usually be supported and illustrated by reference to other cases and always by the display of specimens or dissected parts. It will readily be appreciated that this was a most attractive method of presenting surgery and one that was designed to attract and retain the interest of the dullest and laziest members. It must be stressed that he did not merely give an account of a few cases, but used his patients as a text from which he could discuss the wider general principles involved. His students thus not only obtained the benefit of seeing the cases but were able to absorb the same information which had been presented in a rather indigestible form in the first course of lectures.

His success was immediate, and the number of students began to increase at once. Soon he was to have the biggest and most popular classes of any surgical lecturer in Europe. At one time the numbers attending reached over four hundred.

This change in teaching was a happy one for him in yet another way; it gave him the opportunity and stimulus to work constantly in the wards, selecting suitable patients for his lectures, observing the results of treatment, and generally expanding and improving his knowledge of the physiological and pathological principles of disease and its treatment as outlined by Hunter. He would go round with the surgeons at both hospitals, but particularly with Cline, to whom he was virtually an assistant. On these rounds he would also take the opportunity to teach any of his own students who were there. In this way he established a continuous and regular course of true clinical instruction, free from the formality of a routine lecture; probably very much as the daily teaching rounds of the surgical registrars are carried out at Guy's to-day.

By 1793, when the winter session opened, he was firmly established as a successful and popular lecturer, and his growing reputation was reflected in the steady increase in the size of his class. At this time, also, he was honoured by the appointment of lecturer in anatomy to Surgeons' Hall, no doubt largely owing to the influence of his uncle, William Cooper, and his master, Cline, both of whom were prominent members of the Council of the Company of Surgeons. Their support was amply justified for he made a great success of the appointment and his uncle, in particular, was delighted and impressed with his ability.

The duty of Professor of Anatomy was to dissect publicly and lecture upon the bodies of criminals executed at the Old Bailey. The Surgeons' Hall was at that time situated in the yard of the Old Bailey. Although he was only twenty-five years of age, and up to then unknown as a lecturer outside his own school, he drew a large audience. In his own words:

> The lectures were received with great *éclat*, and I became very popular as a lecturer. The theatre was constantly crowded, and the applause excessive. My uncle was quite delighted, and Mr. Cline complimentary, which he seldom was.

The appointment, which was an annual one, was renewed in the next year, and he again gave the lectures. He, however, preferred not to continue for a third year when asked to do so.

It will be remembered that at the time of their memorable visit to Paris in the summer of 1792, Mrs. Cooper had been carrying her first baby. The child, a baby girl, was born safely in November 1792 and was given the names of Anna Maria. The young parents' delight and happiness in the child was unfortunately soon marred by symptoms of illness which appeared early in 1793. Cooper had a firm belief in the value of fresh air in the treatment of sick children and rented a cottage in the then country district of Pentonville; throughout the summer months Mrs. Cooper took the baby to the cottage every morning to spend the day in the open air. A certain amount of improvement followed this, but in the following winter the child again became ill and in spite of every care and attention continued to waste "until at last an acute attack of water in the head coming on", she died in March 1794, when only twenty months old.

The grief and disappointment bore hard upon the parents. Astley was deeply moved and it was long before he could lessen his sorrow. The effect on his wife was even deeper, and indeed her sorrow and disappointment were never really assuaged. As the months and years passed her distress continued and she

> appears not to have been able by any effort, nor even by the warmth of feeling with which she watched the growing prosperity of her husband, to avert the melancholy impressions induced by recollection of her lost child. It was evidently too painful an effort for her to assume a responsive gaiety. She seemed ever to be missing something, and all her natural serenity of mind in consequence was lost to her.

Unfortunately they were not to have any more children of their own, but Mrs. Cooper was able to find some solace in adopting a child. This was a little girl of about the same age as their own child at the time of its death, and Mrs. Cooper first began to look after it owing to the mother's illness. When the mother died, the father readily agreed to its being adopted by the Coopers and the little girl was brought up by them as their own. Sarah grew to be a healthy and happy child who repaid all the love and care that were willingly given her. Her death in 1814, in giving birth to a still-born child but one year after her happy marriage, was to be yet another bitter blow to Mrs. Cooper and one to which she was never reconciled.

While engaged in his lectures, clinical teaching and research, Astley Cooper did not neglect his contact with other workers. Not only was he an ardent attendant at the meetings of the Physical Society but his appreciation of the value of mutual discussion and his interest in the teaching of students led him to found a society for apprentices and pupils for whom the meetings of the Physical Society were then too advanced. This society continued for several years and may well be considered the precursor of the present Pupils' Physical Society of Guy's, the oldest students' medical society in London. The members used to meet to report and discuss cases of interest, and this was so successful that in 1798 a volume was published of selected essays based on papers read at its meetings. This volume, *Medical Records and Researches*, contains Astley Cooper's first surgical publications; these were two essays, one a report of a case of diaphragmatic hernia met with in the dissecting-room, and the other a report on observations and experiments on obstruction of the thoracic duct; and three other papers by doctors in practice in the country but reported by him. His name was joined with those of Haighton and Babington as editors of the volume.

The last event of significance during these fruitful years was his removal, at the end of 1797, from Jeffries Square to number 12, St. Mary Axe, a house just vacated by Cline. As we know, he had decided to abstain from private practice for at least three years after his apprenticeship ended so that he could, unfettered, devote himself to furthering his training. He earned an occasional guinea during these years, but even in 1796 his total income from private patients was only

£100. When Cline moved from St. Mary Axe to Lincoln's Inn Fields he strongly advised Astley to take over the house, and this Cooper did for two reasons. In his own words: "It is well calculated to private practice, and has also a large warehouse attached to it, which will make a most admirable dissecting-room."

His practice now grew steadily, although it still remained comparatively small, especially in view of his position and attainments in hospital practice and as a lecturer to the United Hospitals and Professor in Anatomy to Surgeons' Hall. By 1799, the last year of his assistantship, his income from this source was £610. In the following year, when he was appointed to the staff, it reached £1100. At the same time he daily saw a large number of poor patients at his own home early in the morning; much after the fashion of an out-patient clinic.

His uncle was due to retire from the staff of Guy's Hospital in 1800 and Astley Cooper was naturally anxious to be appointed to fill the vacancy. It seemed that his position and achievements at the hospital would make this almost certain. Most of his friends took the appointment for granted and even the Treasurer of the Hospital, Benjamin Harrison, favoured him. His election was not to be so easy, however. His uncle was not in favour of his appointment, probably chiefly from envy and pique. Not only had Astley's success raised a certain invidious comparison between the two, but in addition his uncle resented his great popularity with the students. Although close bonds existed between the two Hospitals it is natural that a certain rivalry should exist between the members of the two staffs, and Astley's avowed preference for the work and ability of Cline and his leanings towards St. Thomas's had not served to make things easier with his uncle.

But much more serious than this was his political persuasion, which nearly caused him to lose the post. From the earliest and most impressionable years of his residence with Cline he had been introduced to the new principles of democracy and was familiar by personal contact with the noted reformers of the day, both at Cline's house and at the meetings of various political societies. He displayed the same open-hearted enthusiasm to these interests as he did to all other things. The tragic and horrible events he saw on his visit to France cooled his feelings only for a few months, and he quickly resumed his political activities as if he had seen nothing untoward in the workings of Revolution. At the time of his uncle's retirement England was at war, and members of a party or organisation which had democratic leanings and even hoped for a social revolution at home found no favour.

Although Benjamin Harrison was impressed from Astley Cooper's professional attainments that he was the right man to recommend to the Governors for the new appointment, he was (as he told Bransby Cooper in later years) very worried about his political activities and felt that they debarred him from the post. At this very time he received an anonymous letter calling his attention to the fact that

> The candidates proposed for your choice at Guy's Hospital on Wednesday, are three gentlemen of tried abilities, who have served their king and country during the present war, and one who is a Jacobin, friend of Horne Tooke, and an associate of the celebrated Thelwall.

This was so serious that he at once sent for Astley and explained to him the difficulties in the way of his appointment, especially in view of this latest warning, which contained facts the truth of which there could be no denying.

Fortunately Astley Cooper was able to give a complete and satisfactory answer, and an assurance that he had already abandoned all political interest and activities. His assurance carried greater weight owing to his description of the incident of his decision. He and his friend Coleman had been for a walk in Epping Forest, and instead of proceeding in their usual state of exuberance they walked for nearly half an hour in silence. After they had challenged each other with their moroseness, Cooper said: "Do you know, Coleman, I feel a nasty disagreeable sensation about my throat", and at the same time grasping his neck continued, "and I should not be much surprised if that is what we come to if we persist in our intercourse with our present political set of associates. What good has it ever done us, Coleman? I am certain these unsettled discontented views are exciting no less harm on our minds, than on our success in life. We had better be done with them, and think more of paying obedience to the laws of our country than of disputing their justice and propriety." Coleman readily agreed to this and admitted that he had been unhappy from the same cause. After some more discussion they determined to part with their democratical friends and to abandon all participation in politics and party.

Harrison was at once convinced and told Cooper that the greatest obstacle to his appointment had now been removed. Cooper, aware of the powerful interest which his opponents had, gave up all other business and visited each of the seventy-two Governors of the Hospital to present his application. When the Board of Governors met he was at once chosen to succeed his uncle and he thereupon joined the staff as Surgeon to Guy's Hospital in October of the year 1800.

His rejection of his political activities was absolute, and in later years he stated "that as the duties of a surgeon extend alike to men of all parties and views, it must be most unwise for him to attach himself to any one particular set, and thus render adverse to him all maintaining contrary opinions". The wisdom of his decision not to mix politics and surgery should be beyond question, and it says much for the clarity and firmness of his mind that he realised that his true task in life lay in the furtherance of surgery and surgical knowledge and that his special attributes demanded that he should give his undivided attention to this end. Even in the later years which have beguiled so many other great medical men into politics, he did not forget his resolution.

CHAPTER IV

SURGEON TO GUY'S HOSPITAL

NOW began the great years; great for Astley Cooper and no less great for Guy's Hospital. In increasing degree the patients received the benefits of his skill and courage, the students the advantage of his experience and teaching, and his colleagues on the staff gained no less from the lustre that his name brought to the practice of surgery at Guy's. One cannot introduce this chapter in his life better than by quoting from a letter written to Bransby Cooper by William Roots, who was dresser to William Cooper at Guy's Hospital.

> In 1800 Mr. William Cooper resigned his post as surgeon to Guy's Hospital and his nephew Mr. Astley Cooper was unanimously elected in his room; and an important era was it to the fame of this school of surgery, for Mr. Cline's presence at the sister hospital had given a predominant character and sway to St. Thomas's. Guy's Hospital now began to share this great pre-eminence, and one of the proudest of my professional recollections is, that upon the election of Sir Astley to this post at Guy's, he in the kindest way imaginable requested me to continue to dress for him during his first year, without paying the usual fee, saying at the same time, by way of lessening the obligation, "that it was not only to serve himself, by having one he could depend upon, but that he wished it as a compliment to his uncle, whose favourite he knew I had the happiness to be."
>
> From the period of Astley's appointment to Guy's until the moment of his latest breath, he was everything and all to the suffering and afflicted; his *name* was a host, but his *presence* brought confidence and comfort; and I have often observed that on an operating day, should anything occur of an untoward character in the theatre, the moment Astley Cooper entered, and the instrument was in his hand, every difficulty was overcome, and safety generally ensued.

Although written as an obituary, what finer words can we have than these to picture Astley Cooper on the threshold of his great years as surgeon to Guy's Hospital. "Until the moment of his latest breath, he was everything and all to the suffering and afflicted; his *name* was a host, but his *presence* brought confidence and comfort."

We also have a fine word-picture of his appearance in these early days on the staff from Benjamin Travers, who was apprenticed to him at this time and who afterwards became surgeon to St. Thomas's Hospital.

> Astley Cooper, when I first knew him, had decidedly the handsomest, that is, the most intelligent and finely-formed countenance and person of any man I remember to have seen. He wore his hair powdered, with a queue, then the custom, and having dark hair, and always a fine healthy glow of colour in his cheeks, this fashion became him well. His frequent costume, during the summer, when taking horse exercise (for at this season he rode daily on horseback) was a blue coat and the yellow buckskin breeches and top-boots then much in vogue. There was a fine and quickly responsive animation in his eye, and though he was of full height, the outline of his frame was muscular and glowing, without an approach to corpulency. He was remarkably upright, and moved with grace, vigour and elasticity; nor was he altogether unconscious of the fine proportions of his frame, for he would not unfrequently throw his well-shaped leg upon the table at a lecture, when describing an injury or operation of the lower limb, that he might more graphically demonstrate the subject of his discourse.

Of his work at this time Travers says:

> Guy's Hospital, to which he was newly elected surgeon, shared a large portion of his time. He was in the habit of visiting it at any unoccupied interval, in addition to his regular days of attendance. He would look at particular or urgent cases, before and after lecture, and he generally went round as a florist would visit his parterre, with two or three elder students on a Sunday morning. His interest in his profession was genuine, independent of the additional incitement of the love of reputation or of gain. This was equally evinced in the dissecting-room, and in the wards of the hospital. He was distinguished by an untiring energy of character, and the faculty of communicating his opinions, and his ardour, by conversation with the young men around him.

Although absorbed in clinical work both in his growing private practice and in the wards of the hospital, Astley Cooper did not relax his constant dissection and experiments. One reason for his taking over Cline's house in St. Mary Axe was that it was convenient for this work, and he sometimes had as many as thirty dogs, besides other animals, at one time in the hay-loft. He was very active in the study of comparative anatomy and obtained a constant and varied supply of material from the fish and poultry markets and from a taxidermist. In addition he had an arrangement whereby all the animals that died in the Menagerie at the Tower were sent to him to dissect. This was the source of the famous elephant which he obtained for dissection in 1801. Undaunted by its size (probably in fact spurred on since he had actually helped John Hunter to dissect a whale) he determined to have it brought to his house. The carcase was transported, covered with a large cloth so that it would attract no attention, and was carried into the courtyard of his house. It was found, however, to be impossible to get it into the outhouse where the dissecting-room was and eventually it had to be left out in front of the building. Again quite undaunted Cooper decided to dissect the body in his courtyard, after it had been hidden from the gaze of a large and interested crowd by a carpet hung over the railings. Several students from Guy's helped him with the dissection, which was continued until every part had been examined, even to the bones. The skeleton was then articulated and placed at first in the museum of St. Thomas's Hospital and later at Guy's.

In addition to his organisation to secure a supply of animals for dissection, Astley Cooper's duties as lecturer in anatomy involved him in the difficult problem of the supply of human subjects for the students. In this way he necessarily came into close association with the resurrection men; as a student he almost certainly took part in "resurrections" himself. The stories told of his adventures and experiences with the resurrection men are many and most interesting, although often gruesome. A full account of these men and their activities is given by Bransby Cooper in his biography of Astley Cooper, and those interested are recommended to read the details there. It is felt that too much space would be taken up in this work by enlarging on the subject. It is well known that Astley Cooper was notorious in his active associations with the resurrection men and in the support he gave them. The occasions were few on which he was not paying maintenance to the families of some of them while the men were in prison for their body-snatching.

He used the warehouse at his home not only for animal dissection but also for the reception of human subjects and for some human dissection. This he did in spite of the fact that he was liable to be arrested and tried for acting as a receiver of the bodies. His activities were well known in the neighbourhood, but as he was circumspect and had also had the windows blacked over so that he could not be overlooked, no notice was taken. Owing to some friction between the resurrection men and the hospital porters preventing the bodies being taken direct to the dissecting-room, there was a time when he arranged for the subjects to be left at night in his courtyard from where they could be later collected and sent to the hospital. On one occasion a coachman, who had been engaged to remove three hampers containing bodies from his house to Guy's, became suspicious and called the watchman who announced his intention of reporting to the Lord Mayor in the morning. Cooper called on the Lord Mayor at breakfast, and, after discussion, the matter was not only disposed of but an assurance given that he would not be molested again.

The adventures and difficulties with the resurrection men continued while he was a teacher of anatomy at Guy's, and it was only after he had retired that the passing of the Anatomy Act in 1832 put an end to this dark chapter in the history of surgical training.

In the year 1800, the year in which he was appointed to the staff at Guy's, Cooper distinguished himself by a paper read before the Royal Society on observations on the hearing of two patients in whom he had discovered a perforation of both ear-drums. This had not been described before, and it had been supposed that it would inevitably be associated with deafness. He found that not only did his patients hear well but in one the ear was "nicely susceptible of musical tones". In 1801 he read a second paper before the Royal Society in which he suggested that certain forms of deafness might be relieved by myringotomy, his suggestion being based on the observation of a retracted membrane which he adduced to absorption of air secondary to obstruction of the Eustachian tube. His argument was that by perforating the drum-head air would once more be admitted to the middle ear and the membrane would be able to function, as it must necessarily be placed between two columns of air, like an ordinary drum, to do so. He had observed that the temporary deafness sometimes occurring with a common cold was associated with the same retraction of the drum, where it was evident that it could not depend upon any disorganisation of the intricate parts of the ear.

For this paper he was awarded the Copley Medal of the Royal Society, the highest honour that the Society could bestow. No little achievement for a young man of thirty-four, especially when it is considered that his great preceptor, John Hunter, was awarded the medal only fifteen years before, and nearly at the end of his career. Cooper was elected a Fellow of the Royal Society in February 1802.

The year 1804 was a most important one for it saw the publication of the first volume of his greatest work, his treatise on *Hernia*. It appeared in folio size, a most impressive and masterly production, adorned by numerous beautiful engravings of superb dissections of the normal and pathological anatomy of hernia. No surgeon's education is complete until he has turned the pages of this book. It is striking in every way; at first sight the large folio atlas appears cumbersome, but it was a happy decision of his that made him use the folio size. Its impressiveness suits the work, and the numerous plates, mostly life-size, can be studied easily since several appear on a single page. The study of the large pages is itself restful and a change from the common text-book.

The volume is dedicated to Henry Cline, his master. In the preface he writes:

> I have almost uniformly, in this work, avoided quoting the opinions of authors on this part of surgery. This I have done, certainly not from any wish to slight or undervalue the labours of some of the most excellent physiologists and practitioners that have advanced our profession, but because I wished to confine myself to the very wide scene of observation afforded by the two noble institutions of St. Thomas's and Guy's Hospitals, and to that portion of the practice of the metropolis, which I have been personally enabled to authenticate. *I have therefore related no case, and given no remark, to the truth of which I cannot vouch.*

The italics of the last sentence have been introduced in emphasis of this guiding principle in Astley Cooper's teaching. It should be obvious to anyone who studies this treatise that, apart from the immense clinical experience revealed, it must have entailed years of hard work; not only collecting, dissecting and preparing the specimens, but selecting them and superintending their drawing and reproduction. The letterpress

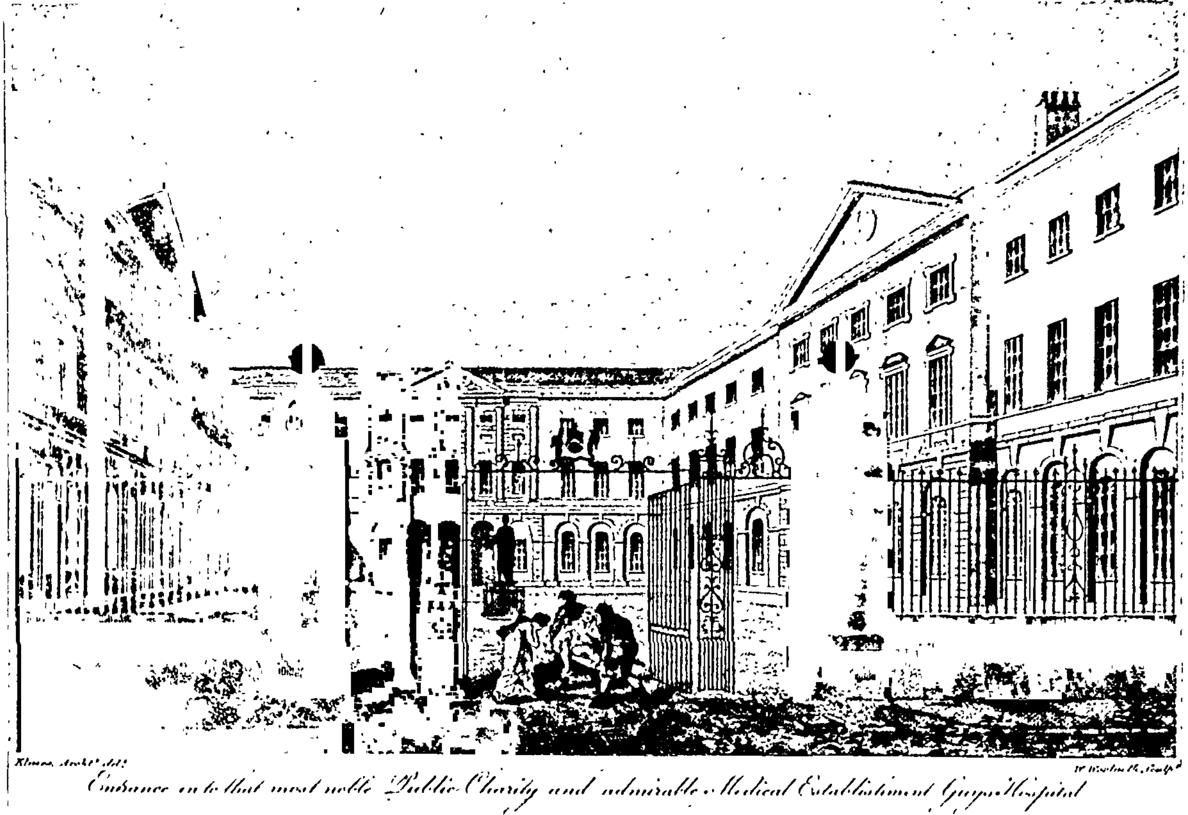
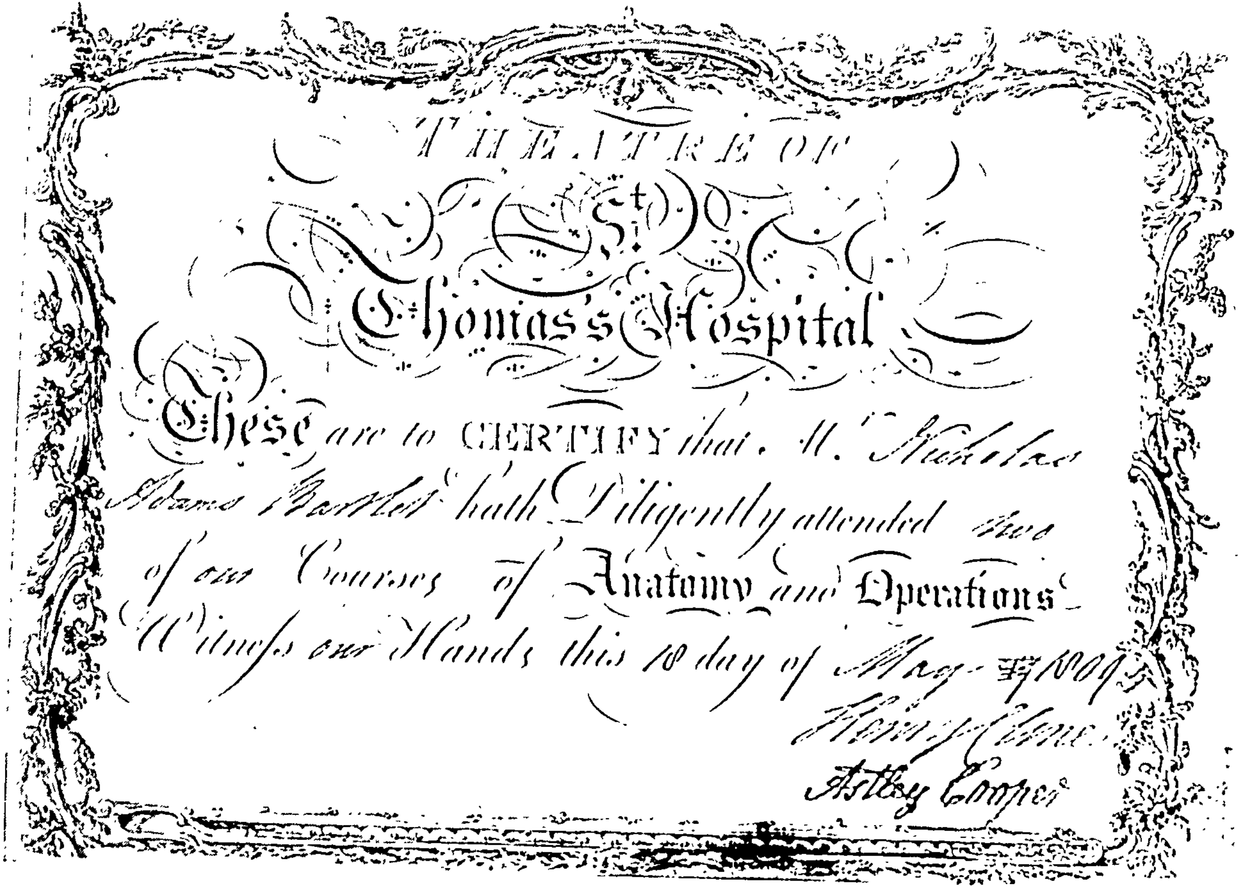

Klinen, Archt. del.
W. Woolnoth, Sculpd.
Entrance in to that most noble Public Charity and admirable Medical Establishment Guy's Hospital

PLATE I
Guy's Hospital in 1799.

[To face page 24



THEATRE OF

St. Thomas's Hospital

These are to CERTIFY that Mr. Nicholas Adams Bartlet hath Diligently attended two of our Courses of Anatomy and Operations

Witness our Hands this 18 day of May 1809

Henry Cline

Astley Cooper

PLATE 2

Certificate issued by Henry Cline and Astley Cooper.

appears to be somewhat scanty on the big pages, but when reprinted in an octavo volume it is seen to occupy 170 pages. The preparation of this volume must have taken much of his time in the early years of the century, which were also his early years on the staff. It dealt with inguinal hernia, while the second volume was concerned with crural (femoral), umbilical, obturator, sciatic, phrenic (diaphragmatic) and mesenteric herniae. The labour entailed caused the publication of this second volume to be delayed until 1807; it was then dedicated to Professor Monro, professor of anatomy at Edinburgh, for whom Cooper formed such an admiration on his visit there in his student days.

A fuller account of the actual surgical details of this masterpiece will be given in a later chapter. Its success was immediate and the copies were all sold. They were priced at two guineas per volume, but so great had been the cost of production that Astley Cooper had to spend a thousand pounds of his own money. His reputation was, however, made by it, for it was at once accepted at its proper value by all surgeons both at home and abroad. His fame became international and placed him in the highest rank amongst European surgeons.

So complete and accurate were his observations and teachings on the subject of hernia, many of them original, that even to-day but little new can be added. The surgical importance of hernia is so great from its common occurrence, from the considerable disability and the deaths that it causes, and from the exact knowledge of the complex surgical anatomy required in its treatment, that no surgeon will have any difficulty in appreciating the fundamental character and permanent value of this contribution of Astley Cooper's. His enthusiasm in the study, dissection and preparation of specimens to illustrate the work spread to many of his associates and he received wide help. It says much for his charm of manner and popularity that he had no difficulty in gaining the assistance of doctors and surgeons from all parts in and around London in supplying him with interesting and rare cases of hernia to study or specimens to examine. In his later work on fractures and dislocations one is impressed with the almost profuse reference to and description of specimens and cases referred to him by his many friends.

As an acknowledged authority on hernia he soon drew patients from all parts of the country who came for his advice.

Scarcely less important than his contributions to the subject o hernia were his studies and operations on arterial diseases. It was i November 1805 that he performed the first ligation of the commo carotid artery for aneurysm. The case was an advanced and unfavourable one and the patient unfortunately died three weeks after th operation. Nearly three years later a favourable case presented itsel and this time he was completely successful. The patient lived fo thirteen years after the operation, and it is characteristic of Coope that he secured an autopsy and completed his clinical account of th case in an article which appeared in the first number of the *Guy' Hospital Reports* in 1836. His ligation of the carotid artery was not jus a bold surgical operation; it was a logical step from his animal experiments and observations on man made over many years. The whole fiel of his contributions to arterial surgery is so important that a specia chapter is devoted to it, and further description is postponed unti then except to make bare mention of two other operations. One o these, that of successful ligation of the external iliac artery, reminds u of the association of his name with the surgical approach to the vessel Abernethy of St. Bartholomew's Hospital has the credit for the firs successful operation. Cooper's was the second, and in all he performe the operation successfully nine times. His first patient was operate upon on the same day on which he performed his successful ligation o the common carotid. The patient lived for eighteen years and Coope likewise obtained the specimen which is also fully described an depicted in the first volume of the *Guy's Hospital Reports*. In 1817 cam the culmination of his work on arterial surgery, his case of ligation o the abdominal aorta. Perhaps the most remarkable operation of hi career.

Astley Cooper's early appreciation of the value and importance o medical societies has been mentioned with the account of his stead support of the Guy's Physical Society, his attendance at meetings a Hunter's house in Windmill Street, and his foundation of a student' society at Guy's. He was also a member of the Medical Society o London which had been founded some forty years before and now ha not only a large membership but one which certain of its member felt was neither select nor scientific. In 1805 various physicians an surgeons accordingly met and decided to form a new society, the

Medico-Chirurgical. Astley Cooper was appointed its treasurer, a post which he held for many years. At the first meeting of the Society in January 1806 he presented a paper on his first case of carotid ligation. This was the first paper in the first volume of the *Transactions* which appeared in 1809, the volume also containing an account of his second and successful case. He was a prominent and important supporter of the Society, and many papers by him appeared in its *Transactions*.

CHAPTER V

HIS DAILY WORK

IN 1806 Astley Cooper moved from St. Mary Axe to a house in Broad Street which was to be the scene of much of his hardest work until he moved to the West End in 1815. The years at Broad Street were his most successful and patients came in large numbers to see him. His nephew, Bransby Cooper, has given us an account of his daily routine at about this time; Bransby had spent two years apprenticed to a surgeon at Norwich Hospital and came to London in 1811 to study at the United Hospitals. Astley Cooper then delivered the surgical lectures entirely by himself, but shared the lectures on anatomy with Henry Cline, junior. In the Museum of Antiquities at Guy's Hospital is a certificate issued by Cline (senior) and Astley Cooper to show that this course of instruction in anatomy and surgery had been attended. As it is of some interest it is here reproduced (see Plate 2, page 25). At this time over 400 students were attending Cooper's lectures, forming the largest surgical class in Great Britain.

Astley Cooper rose every morning at six o'clock, even during the winter. As soon as he was dressed he went into his private dissecting-room, where he worked till half-past seven or eight. After this he began to see non-paying patients who came in large numbers even at this early hour. Breakfast was a short meal accompanied by a glance at the newspaper. He took no more than two well-buttered rolls and tea; now and then he would read aloud some paragraph from the newspaper. He would then suddenly jump up, and

> as he held the door in his hand, would turn round, and with one of his sweet, benign smiles, take leave of the party for the day; for none of the women members of the family, at any rate, would have the opportunity of seeing him again until the hour for dinner.

From the breakfast-room he went into his consulting-room, where he would generally see a continuous stream of patients until one o'clock. He was at work all this time and even if there was a gap between patients, or he finished early, he would run to his dissecting-room to continue a piece of work that had been left ready.

At one o'clock his servant announced that the carriage was at the door; at the same time often whispering that the house was still full of patients. To this, sometimes he would listen, and say: "I will see one patient more"; and then perhaps: "I think there is time for a second." If, however, the urgent call of a third induced him to see him, and as soon as he was gone he found that perhaps half an hour had elapsed, he would fly into a rage, abuse Charles, his butler, for detaining him, and jumping into his carriage declare that he was certain the Governors of the Hospital would deprive him of his situation for his negligence.

Sometimes the people left in the hall and waiting-room were so numerous and importunate that he dreaded the ordeal of passing them on his way to his carriage. He would escape through the back of the house into his stables, and so into the passage by the side of Bishopsgate Church. He would then run round to his carriage in Wormwood Street, where his coachman would drive to pick him up and then take him to Guy's. Bransby Cooper says:

> I have often seen him laugh at the difficulties in which he had left his servant; especially when he had escaped into the stable-yard, without Charles being aware of his flight.

When he reached Guy's at least a hundred students would be waiting for him on the front steps. South says:

> As his carriage stopped at the hospital steps he was out in a moment and skipping up like a bright schoolboy. He was immediately surrounded by a crowd of pupils amongst whom he, towering like Saul above the people, rushed, for walk he did not, up the ward staircase, the pupils pushing and scrambling so as to get near.

We are told that as he entered the ward he invariably took off his hat; it should be remembered that it was not until many years later that the habit of doctors and students entering the wards wearing a hat was stopped. The students hurried forward in front of him so as to secure a front place, but always leaving a passage for him on his way to the patient's bed. He then, smiling as he went at the struggles of his students for the best place, generally moved to the front of the bed so that he could read the patient's name on the card which hung there. This was a graceful touch which allowed him to address the sick man by his name,

> and this he did with a tenderness of voice and expression, and with an interest so clearly depicted by his manner, that he at once acquired the confidence, respect and gratitude of the patient. It was at the bedside that, I believe, he shone in his greatest lustre. The few pertinent questions which he asked soon unfolded to his mind the nature of the case, and the quickly-formed, just diagnosis, was one of the most striking evidences of his professional skill. If surgical operation were required, he would at once, in a manner so judicious, enforce its necessity, as to destroy half the horrors of its anticipation. He usually, indeed, gained the consent of the patient, and induced a state of mind so free from alarm, by the manner in which the information of its necessity was conveyed, as to render him at once fitted to submit to the trial he had to undergo. Cases, however, requiring immediate operation, are rare, and he would generally pass from bed to bed until the clock struck two, when, almost as if by magic, the pupils would suddenly leave the ward, run across the street to St. Thomas's Hospital, and take their seats in the anatomical theatre. In a few minutes Mr. Cooper would appear among them.

The lecture lasted an hour and he would then wait to answer questions. On leaving the theatre, he would generally go into the dissecting-room, look round at every table and make occasional comments on the dissections. He usually left the hospital at half-past three, taking in his carriage with him one of his apprentices or dressers to help him at a private operation or perhaps, when his regular secretary was elsewhere engaged, to write notes for him while he dictated on his rounds.

> He was thus commonly occupied until half-past six or seven in the evening. The well-known and violent rap at the door proclaimed his arrival, and in the next minute he was in the drawing-room, or if very cold weather, standing before the fire in the dining-room, without coming upstairs at all. In the latter case, if alone, he frequently sent up for someone to come and talk to him, and then, while warming himself, entered into lively conversation until dinner was upon the table. Notwithstanding all the labour, physical as well as mental, of the day—and he had already gone through sufficient to exhaust most men, however active—he was ever cheerful at this hour, and the meal always passed off

> agreeably when he was present. He did not eat with epicurean elegance, and possibly acquired his negligence in this respect from his hearty appetite, and the remarkable rapidity with which he swallowed his food; hating, apparently, to occupy much time in the pleasures of the table. He used to drink two, and sometimes three tumblers of water in quick succession, seldom taking wine by choice at dinner.
>
> Directly the cloth was removed, he would look at his watch, and if it were the evening for his surgical lecture, after taking a card out of his pocket, and with a pencil making a few short notes for the heads of his subject, he would hastily swallow two glasses of port wine; say he had ten minutes to sleep; and to the surprise of everyone present not aware of his peculiarity in this respect, would the next instant be sound asleep in his chair. Not unfrequently, without being roused, he would start up at the expiration of the period he mentioned, give a parting smile at everybody in the room, and in a few seconds again get into his carriage and drive off to the hospital.

If it were not a lecture night, and there were no visitors, he would sit and talk to the family, and ask his apprentices questions about their day's work. In the drawing-room, he could scarcely ever resist half an hour's sleep on the sofa, and no conversation or noise would appear to disturb him. On these evenings his carriage was usually ordered at eight o'clock or half-past, but frequently would be kept standing at the door until half-past nine or ten. When this happened and he realised how late it was, he would start up, probably with an exclamation of: "God bless my soul! I have three hours' work yet to do"; and would drive off and not return home until midnight.

> Then the same loud rapping and ringing, repeated almost on the instant if not immediately attended to, announced his return; and it was not a little singular, with his natural kindness towards everyone, that he allowed his servant to rap with the same vehemence at all times, whether in the middle of the night or in the busy hours of the day.

This account by Bransby Cooper of his uncle's daily routine during his busiest years in Broad Street is perhaps the most interesting feature in his biography. Written by one who was a regular visitor to the house its accuracy is reflected in the simple vividness with which it tells its tale.

CHAPTER VI

FINAL YEARS AT BROAD STREET AND HIS MOVE TO THE WEST END

THE account given in the last chapter of Astley Cooper's daily routine at this time leaves no doubt that he was working almost as hard as a man can work. In 1813, however, another task fell to him, for he received the honour of being appointed Hunterian Professor in Comparative Anatomy by the Council of the Royal College of Surgeons, a post which entailed delivering a course of twelve lectures. Although he had studied comparative anatomy by constant dissection for many years, had performed many physiological experiments on animals and indeed had since 1795 concluded his course of anatomy lectures with several talks on comparative anatomy, he was not sufficiently well equipped to give a series of twelve authoritative lectures without much study and preparation. It would have been understandable if he had declined the professorship in this subject. The similar appointment in surgery would have been much easier for him and more acceptable, but this had been offered to Abernethy. Conscious of the honour he decided to accept it, not because he wished to but because he felt it to be his duty. His heart was not really in the task, but he set himself in grim earnest to make a good thing of it. In later years he wrote:

> The choice of me as their lecturer, although flattering, gave me so much additional work, that the very prospect of the undertaking half killed me. But I was determined to put to the test what industry could do, and was obliged to be content often with three or four hours' sleep; for I still lectured at St. Thomas's on anatomy and surgery, was surgeon at Guy's Hospital, and had an enormous share of practice.

The burden of his practice can be well imagined when it is said that in 1815, the year in which he delivered the second course of lectures, his professional income reached the unprecedented figure of £21,000.

He but rarely reached home from his last rounds until midnight or after and usually rose at six. He now decided to curtail even this short time of rest and began to rise at an earlier hour in addition to giving up all his leisure time to dissection. He did this since he felt that he had no time to read the writings of others but would best prepare for the lectures by his own observations. The laboratory assistant he employed at this time slept in a room next to his and every morning would be awakened by Cooper rapping on the wall as early as four or five o'clock. They began dissection at this hour even in the winter, using candle-light. Their labours were incessant, and they resorted to every means to procure animals of all types for dissection. On hearing that a large number of rare sea animals were to be obtained at Weymouth, particularly of the cuttlefish tribe, whose structure and habits he wished to investigate, Cooper sent his assistant down there, and he spent a fortnight procuring specimens. These were preserved either whole or partly dissected and sent up to London. By these labours he achieved his object and when the first lecture was due to be given he had collected a huge amount of material. Clift, then chief conservator of the Museum of the College, said the preparations were brought to the lecture in coach-loads and being chiefly recent and half-dried and varnished, "the discourses were overpowering and highly perfumed". For the opening lecture of his second course he sent to the College specimens from more than thirty different animals, and among these were parts from the lion, hyena, porpoise, seal, coati-moudi, otter, beaver, monkey, musk-deer, etc., in addition to specimens from every quadruped found in this country. The specimens afterwards went to the museum at St. Thomas's Hospital. The lectures were popular and well attended, the audience never being less than three hundred, but Cooper was not really satisfied with them. He later wrote:

> If they had given me surgery, my labour would only have been one half, and I should have had the theatre doubly crowded. I was, however, already too successful.

The course of lectures in the first year, 1814, had to be abandoned suddenly owing to the tragic death of his adopted daughter. The disturbing effects of his sorrow coupled with the great labours of his practice, made it impossible for him to continue. The next series was begun in March 1815 when he gave fifteen lectures; in June 1815 he resigned the professorship.

It is not difficult to realise that no man's constitution, however strong, could stand up to the strain of this pressure of work indefinitely, and at this time Cooper began to feel that he must do less. This need to escape from the immense fatigue of his enormous practice caused him to decide to leave Broad Street and to move to the West End. This he did, not through any falling off in enthusiasm in his work, but as a matter of urgent necessity, for his health showed signs of giving way. The success of the lectures on comparative anatomy had been achieved only at a cost, for now appeared for the first time the signs of vascular changes which ultimately led to his death.

In spite of the continued physical fatigue, exertion of mind, and insufficient sleep to which he was subjected, his spirits scarcely ever flagged. Being deprived of enough exercise he began to get stout, and his natural healthy ruddiness of complexion began, under exertion, to reveal a purplish congestion. What really alarmed him was the onset of attacks of vertigo which obliged him to catch hold of something nearby to prevent himself from falling. One day, when the Duke of Manchester had called to consult him, he was seized with one of these attacks and before he could save himself, fell to the ground. On recovering he at once earnestly requested the Duke not to speak to anyone of what had happened; an entreaty which was duly honoured. He realised that overwork was at the bottom of his disability and accordingly decided to leave his city practice at Broad Street and move to New Street in the West End. This he did in 1815 and at once began to spend an hour before breakfast in riding or walking in the parks so that the exercise might help to restore his health.

In 1811 he had bought a country house and estate at Gadesbridge in Hertfordshire, principally so that he could spend the week-ends there when his work allowed him. When his adopted daughter died in 1814 Mrs. Cooper could no longer bear to remain in London; her grief at the death of her own baby daughter had been great, but to this new blow she seemed quite irreconcilable and she soon went to live at Gadesbridge and kept house there for her husband when he came down for the week-end and for holidays. Later, in 1817, the difficult domestic situation thus created at New Street was relieved by Mr. and Mrs.

Bransby Cooper coming to live there so that Mrs. Bransby Cooper could keep house for him. This arrangement continued until Astley Cooper retired from active practice in 1827 to Gadesbridge.

It is convenient at this moment to outline a few more details of his family arrangements at Broad Street. Soon after he was appointed to the staff at Guy's he persuaded his elder brother, Samuel Lovick, who had a large family, to allow him to adopt a nephew who had been christened Astley after him and who was his godson. This little boy became a playmate for his adopted daughter and later, when of school age, was joined by another brother Henry; the two brothers went to the Charterhouse school as day-boys. Bransby Cooper, a third brother, did not live at Broad Street when studying at Guy's, but was a regular visitor to the house. The boy Henry was apprenticed to his uncle who wanted him trained as a surgeon; unfortunately he died a year or two later, and it was then that Bransby, who had gone to Edinburgh to take his degree in medicine, returned to London and asked his uncle to accept him as his apprentice so that he might be properly trained as a hospital surgeon. This was agreed to and, as Bransby had recently married, the above arrangement was made; for many years, therefore, Bransby was to become increasingly intimate with his uncle, living in the same house, spending holidays at his country estate with him, and assisting him with his hospital and private practice. Ultimately he succeeded his distinguished uncle as surgeon to Guy's Hospital.

Many of Astley Cooper's articled pupils became well known, and at this time he had with him, in addition to his nephew, Aston Key, Tyrrell and Callaway. At the end of June 1815, a few days after the news of the victory at Waterloo had reached England, a letter appeared in *The Times*, calling attention to the large number of wounded in the hospitals in Brussels and asking for help in the way of bandages, dressings and other necessities. Astley Cooper read this at the breakfast table and thought that a supply of assistants would be equally acceptable. He at once got in touch with the appropriate authority, and by the same evening his two senior apprentices, Callaway and Tyrrell were on their way to Brussels. They were warmly received and given wards of their own to look after; they were soon joined by Aston Key and Henry Cooper and a fifth pupil, Henry Wakefield. The Party stopped in Brussels for several months; Callaway and Tyrrell not returning to London until the beginning of the new session in October. The experience they gained was invaluable, and they were able to do some good and useful work which would not have been possible but for Astley Cooper's suggestion. They were the only apprentices from London who went to help. Astley Cooper himself used to see many wounded officers in London after the war, of course making no charge for his services.

In the next year, 1816, Astley Cooper performed his operation of ligation of the abdominal aorta for a leaking ilio-femoral aneurysm. This occasion is of such great importance that it is described as part of a special chapter. An excellent account of the case and operation appeared as part of a book entitled *Surgical Essays*, written in collaboration with Benjamin Travers, one of his early apprentices and then surgeon to St. Thomas's Hospital. Cooper had a high regard for Travers and wished their names to be associated; in addition the joint authorship mirrored the liason between the United Hospitals. The book was well received and quickly went through three editions in this country, was published in America, and was translated into French and German. It had been intended to issue a second volume of essays but Cooper decided against this, in spite of the success of the first book. He felt that the arrangement of disjointed subjects issued at intervals was not so good as separate monographs. Parts of the *Surgical Essays* later served as the basis of such works, as for instance the essay on fractures and dislocations which appeared in its full form as a separate book in 1822.

Cooper did not move from Broad Street to the West End in order to cultivate a West End practice. So great was his reputation that he already had a large society practice even when he was working in the city, and this connection increased his labours owing to the extra travelling it entailed. By leaving Broad Street he hoped that he would be spared much of this extra exertion, that his city patients would not want to follow him to the West End, thus also diminishing his work, and that he would have more time for relaxation and open-air exercise. Scarcely any of his city patients left him, and in his new house the same scenes were repeated that went on in Broad Street. Although he did not make the huge sums of money as in his last year in the City, he still saw just as many patients at his house.

His practice extended to the highest in the land, and he became the most popular and successful surgeon in London. One of the most remarkable things about the life of Astley Cooper is that he achieved great success in so many of his undertakings. He was successful as a teacher and lecturer, as an anatomist, as a research worker, as a collector of museum specimens for instruction and study, as an author, as a surgeon, as a public figure and as one who in his practice gained the confidence and trust of more patients than probably any other surgeon before or since. The success in everything he turned his hand to will be considered in separate chapters, and in the next we pass appropriately to his achievements and distinction as a practitioner of surgery.

CHAPTER VII

ASTLEY COOPER THE PRACTITIONER

SOME description of Astley Cooper's practice has necessarily been given already in the account of his life and work. We have heard of his early morning consultations for poor patients, the long morning spent in seeing patients at his house; his afternoon and early evening visits following his round and lecture at Guy's, and his final round of visits after dinner at night. Patients were sent or came to see him from all over the country, and he was called into consultation constantly by many doctors, not a few of whom were his old pupils.

Inseparable from a description of his practice is his servant, Charles. This man was a clever, keen, active and resourceful retainer who not only worked hard and energetically for his master, but also managed to do well for himself at the same time. He came to Astley Cooper in 1800, soon after his appointment to Guy's, and remained with him for twenty-seven years until his retirement in 1827. He seems to have been a remarkable character and singularly well fitted to carry out the exacting duties demanded of him in Cooper's practice. He would go to almost any length not to lose a patient and, in those days before the telephone, expended much energy in tracing and fetching his master if he was away from home when wanted. This often meant a fast journey of several miles in a post-chaise, and one that might cost more than the fee forthcoming; this did not worry Cooper at all. He used to say: "It is worth spending any money merely to convince the public that your opinion is at all times to be obtained." Finding Cooper was often no light task and perhaps meant following his trail from one place to another.

Apparently Charles's great failing was his willingness to take bribes from patients who wished to be admitted before their turn to see his master; it is said that he made an income of £600 a year in this way. His great worth as a butler, intelligent, reliable and loyal in all else, must have made Cooper unwilling to dismiss him for this failing, although he often flew into a rage and threatened to do so for this exposure of his patients to extortion. Charles's great skill and tact lay in handling the large numbers of patients who came to Cooper's house every morning. Most of them did not come by appointment and he was subjected to a constant barrage of intimidation by the more importunate ones to get them seen early. Charles turned a deaf ear to all these arguments, unless they were obviously justified through suffering, until his hearing had been improved by coin of the realm.

Cooper's house at Broad Street was big enough to supply ample accommodation for his patients; an ante-room and the consulting-room opened from the large hall; on the same floor were two large rooms occupied by men patients and upstairs were two rooms for ladies. One of the men's waiting-rooms was often occupied by six or eight patients recovering from some minor operation. Astley Cooper performed many such in his own house and, in fact, once he had made up his mind that the operation was needed, at once signalled to his butler who prepared his instruments; the patient was told what he proposed to do and the operation was done at once. There can be no doubt that in those days before anaesthesia, the patient and his relatives were thus saved much of the suffering of apprehension and anticipation.

Many wealthy merchants then still lived in houses in the city, leaving for the country only at the week-end. The opportunities for lucrative practice were, therefore, exceptional and Cooper found that he was paid large fees for his services by these wealthy patients; much larger than he received when he moved from the City to the West End. Consultation fees, paid by cheque, were rarely less than five guineas, and for long-distance visits he was paid on an even more generous scale; one merchant for years paid him £600 a year for visits to his house near Croydon. He sometimes received really large and generous fees for his operations and in 1813, when he removed a stone from a rather eccentric West Indian merchant, he was presented with a cheque for one thousand guineas by the grateful man. As already mentioned, in the year 1815 his fees from practice and hospital lectures reached the huge sum of £21,000, in those days worth a great deal more than to-day. For many years his income was £15,000 a year, and in his active years he probably earned more than any other medical man before or since.

It must not be thought that he was greedy for money. He practised surgery for the love of it and worked as hard, as diligently, and successfully at the prosecution of his private practice as he did at all the other things he touched, many of which, far from being remunerative, cost him money and health. Sir Benjamin Brodie said of him:

> Although he received from his practice a larger income than was ever obtained, either in the medical profession or in any other, he never exhibited anything approaching the vice of avarice. He was in the greatest degree liberal, and apparently careless as to the remuneration which he received. I say this with the utmost confidence, having never known nor heard of a single instance to the contrary, during my long acquaintance with him.

An unknown writer in an obituary in the *British and Foreign Medical Review* said of him:

> The manner of Sir Astley towards his patients has been universally admired; and his kindness and attention, as a hospital surgeon, have been properly appreciated: we know, moreover, that in his relation to his private patients, his character always showed to equal advantage, though this, of course, cannot be so well known to the public. He never spoke of a fee in his life; when he received none, he made it a rule to regard the case as one of distress, and was glad to perform an office of charity. "If we receive more than we expect," he often said, "we return nothing; why, then, should we complain on receiving less than we deserve?"

His success in practice at Broad Street was so remarkable, and so many patients were attracted to London to see him, that some clever quacks and charlatans soon contrived to exploit the unwary by specious advertisements in newspapers and by touting. These men worked under cover of a "Dr. Ashley Cooper" and were known as the "Ashley Cooper set". They flourished for years in a house in Charlotte Street, Blackfriars Road. Many other fraudulent quacks and rogues sought profit from using his name, but Astley Cooper always ignored their activities for he felt that if notice were taken it would provide them with greater advertisement.

Astley Cooper's great success in surgical practice must have been due chiefly to his ability; no man could have been so successful for so many years unless he was able to provide that excellence of diagnosis and treatment which alone justified it. He was undoubtedly the greatest and most popular surgeon of his day. His ability and success as a lecturer and teacher introduced his methods and skill to thousands of doctors, almost all of whom were loyal to him. His success was also aided by his handsome and imposing presence, his charming, friendly and kindly manner and the confidence which he inspired. He had shown by his clear and authoritative writings that his practice was backed by wide experience and knowledge, much of which had been gained by his own research and industry.

His practice extended from the lowest to the highest in the land, and besides many members of the nobility it included many distinguished men and women. In 1826, when his practice was still as large as it had been, he had as patients the King, who was then suffering from an attack of gout, the Duke of York, Lord Liverpool (the Prime Minister), Lord Bathurst (Minister of War), Lord Chatham, Robert Peel, Lord Hamilton and many other prominent persons. The Duke of Wellington was both his patient and his friend. He attended both the Duke of York and Lord Liverpool during their last illness; and although he did not attend King George IV in his last illness he and Sir Benjamin Brodie embalmed him. In the manuscript copy of his museum catalogue (now in the Royal College of Surgeons) can be seen many annotations as to the noble origin of some of the specimens. These were obtained either by operation or autopsy; for instance, we read of the thymus gland from Princess Louise. Lord Liverpool, who died of cerebral haemorrhage, is represented by specimens of calcified femoral arteries. It is interesting that Astley Cooper clearly described what must have been the onset of heart-block in Lord Liverpool; his notes say:

> As he was walking up Downing Street, he felt an oppression upon his breath, and his pulse which had been *seventy-six* in the morning, fell to thirty-eight in the afternoon. It varied between *thirty-eight* and *fifty-four* afterwards, that is, for five or six years. If he went to the House of Lords, and spoke violently as to his action (which he was wont to do) yet his pulse remained the same.

Astley Cooper had another quality which must have been an invaluable one in these high connections in his practice, that of secrecy. Bransby Cooper says:

> the illness of the Prime Minister was a matter of too serious political importance to be the subject of the day's conversation, and my uncle always avoided speaking of such an occurrence at home. The power of keeping matters of this nature secret, was very strongly marked as a

feature of his character, and he has been in daily attendance upon the king for nearly a month, before anyone in the house was the least aware of his visits to the palace. That it might not be known by his servants on these occasions, he used to walk into the park, and enter Carlton House by the gardens.

His successful attendance and operation upon King George IV form the high point of his professional work. In 1820 the King was suffering from an inflamed sebaceous cyst on the head, which was proving very troublesome. He had determined to have it removed, and, although Astley Cooper had no official royal appointment, the King decided to send for him. No better proof could be obtained of the high regard in which he was then held as a surgeon than that the King himself should have selected him for the operation over the heads of his official surgeons. The circumstances of the operation have often been told, and Cooper's fear of a fatal complication such as erysipelas has provided the classic example of the dangers that attended even the simplest of surgical operations in the pre-Listerian days.

When he first saw the cyst it was tender, painful and slightly inflamed, and the King yielded reluctantly to the advice that it should not then be removed. In the spring of 1821 he sent for Astley Cooper to visit him at Brighton. Cooper tells us that the King came into his room at one o'clock in the morning and demanded that he should then and there remove the cyst. Cooper was naturally taken aback at this impulsive request and said: "Sire, not for the world now—your life is too important to have so serious a thing done in a corner. Lady C—— died of erysipelas after such an operation, and what would the world say if this were to be fatal? No, too much depends upon your Majesty to suffer me, at one o'clock in the morning, in a retired part of the Pavilion, to perform an operation which, however trifling in general, might by possibility be followed by fatal consequences." The King hastily recanted, but insisted that the operation should be done as soon as he returned to London.

Cooper asked that Henry Cline should be among those present at the operation and this was agreed to. It was a most gracious gesture of Astley Cooper to hand the scalpel to his old master to complete the last part of the dissection of the cyst. The King bore the operation well and requested that there should be no hurry. He made a good recovery although the sudden onset of an attack of gout a day or two after caused Cooper to fear that the very worst had happened and that infection had supervened.

For this service to the King he was made a Baronet and, at his own request, since he had no son of his own, it was entailed upon his adopted nephew Astley. The baronetcy is still extant. Later the King sent him a present of a most beautiful and costly epergne which he had designed himself. He saw much of the King after this and they became good friends; in addition to treating the King for various illnesses, he often called upon him at Windsor or at Brighton.

In 1828 Astley Cooper was appointed Sergeant-Surgeon to George IV. On the death of the King he was appointed Sergeant-Surgeon to William IV, and as the title-page to his last book published in 1840 shows (see Plate 13, page 99), he was also Sergeant-Surgeon to the young Queen Victoria.

CHAPTER VIII

THE SURGEON

AT a time when London was the best-known surgical centre in the world, Astley Cooper was its greatest surgeon, and to-day, one hundred years after his death, he still ranks as one of the greatest surgeons of all time. His later contemporaries called him "The Prince of Surgery". Let us first consider his ability as an operator, not forgetting that this is but one of the attributes demanded of a good surgeon.

On his appointment to the staff of Guy's Hospital he could not have had great experience as an operator, but had had much training in the fundamentals from his close study of anatomy and his familiarity with dissection over many years, as well as from his numerous experimental operations upon animals. His two senior colleagues, Forster and Lucas, were "indifferent surgeons" and he tells us that his first operation after being appointed to the staff was to help Forster out of difficulties with a lithotomy. Neither of these two surgeons was willing to operate unless Astley Cooper was present.

His dresser William Roots wrote in later years:

> I have often observed that on an operating day, should anything occur of an untoward character in the theatre, the moment Astley Cooper entered, and the instrument was in his hands, every difficulty was overcome, and safety generally ensued.

South said of him:

> For operating with quickness and precision I never knew his equal. . . . His maxim was that a surgeon should have an eagle's eye, a lady's hand, and a lion's heart.

Pettigrew, in his *Medical Portrait Gallery*, says:

> But on days of operation this feeling was wound up to the highest pitch. The sight was altogether deeply interesting; profound silence obtained upon his entry, that person so manly and so truly imposing, and the awful feeling connected with the occasion, can never be forgotten

> by any of his pupils. The elegance of his operation, without the slightest affectation, all ease, all kindness to the patients, and equally solicitous that nothing should be hidden from the observation of the pupils, rapid in execution, masterly in manner, no hurry, no disorder, the most trifling minutiae attended to, the dressing generally applied by his own hand, the light and elegant manner in which Sir Astley Cooper employed his instruments, always astonished me, and I could not refrain from making some remarks upon it to my late master, Mr. Chandler, one of the surgeons to St. Thomas's Hospital. I observed to him that Sir Astley's operations appeared like the graceful efforts of an artist in making a drawing. Mr. Chandler replied: "Sir, it is of no consequence what instrument Mr. Cooper uses; they are all alike to him, and I verily believe he could operate as easily with an oyster knife as the best bit of cutlery in Laundy's shop." There was great truth in this observation. Sir Astley was at that time certainly one of the best operators of the day, and this must be taken in its widest sense, for it is intended to include the planning of the operation, the precision and dexterity in the mode of its performance, and the readiness with which all difficulties were met and overcome.

Laundy was the leading surgical instrument maker of the day, and his name is stamped on the knives in Sir Astley Cooper's box of amputation instruments which may be seen in the Museum of the Royal College of Surgeons. Even after a century of disuse these knives are as bright and as perfect as the day they were used; and in efficiency and beauty of design excel any modern amputation knife that we can buy.

After these emphatic eulogies the more restrained comment of Bransby Cooper and also of Sir Astley Cooper himself should be read. Bransby Cooper says:

> By means of surprising exertion and indefatigable industry, he acquired the most perfect knowledge of practical anatomy, and hence was derived that courage and confidence in himself which rendered him capable of fearlessly performing the most hazardous operations; and although it may be admitted, and he himself, indeed, thought so, that he was never a very neat operator, still his anatomical precision, and his invariable deep consideration, both of the circumstances which rendered the operation necessary, and of the effects which it would produce, ensured, as far as human art could avail, security and ultimate benefit to his patient.

In his own assessment of himself, written in the third person, Sir Astley Cooper wrote:

> Sir Astley Cooper was a good anatomist, but never was a good operator where delicacy was required. He felt too much before he began ever to make a perfect operator.
>
> For the operation of cataract he was quite unfitted by nature.
>
> As an operator for stone, aneurism, hernia and the removal of tumours, prior to his attacks of giddiness, he was excellent, but after that time he was always afraid of being seized with them whilst he operated.

It is not difficult to assess that whereas Sir Astley Cooper may not have been the superb operating surgeon as seen in the eyes of his own pupils, he was an operator of the first order and one whose excellent craft was based on confidence in his own knowledge of anatomy, both normal and pathological. He was a thinking, considerate and sensitive surgeon; not a "hewer of wood and drawer of water", but possessed of an original mind that saw clearly into the unexplored country of unconquered disease. His great contribution as a surgeon was to put into practice and to develop still further the principles revealed and taught by John Hunter. Without the stimulus of his great mind and great determination the Hunterian doctrine would not have travelled so fast and so far. It has been aptly said that the Hunterian ideas gave rise to a ripple in the quiet waters of the surgery of his day; Astley Cooper made the ripple become a flood-tide.

> Before his time, operations were too often frightful alternatives or hazardous compromises; and they were not seldom considered rather as the recourse of despair than as a means of remedy; he always made them follow, as it were, in the natural course of treatment; he gave them a scientific character; and he, moreover, succeeded, in a great degree, in divesting them of their terrors, by performing them unostentatiously, simply, confidently, and cheerfully, and thereby inspiring the patient with hope of relief, when previously, resignation under misfortune had too often been all that could be expected from the sufferer.

These are great words to be said of any surgeon, but we have only to read the first-hand accounts of his great operations, such as ligation of the aorta and amputation through the hip-joint, to understand the character of his influence upon his patients and the complete trust they had in him. "I place my life in your hands, Mr. Cooper, anything you wish I will submit to," was the reply of his patient before the operation for ligation of the aorta, after Cooper had explained the situation carefully to the man. Speaking of the same incident Cooper himself said:

> Sorry indeed should I be to sport with the life of a fellow creature, who might repose a confidence either in my surgical knowledge or in my humanity; but I should consider myself equally culpable if I did not make every possible effort to save a person, whose death was considered inevitable by a disease being suffered to continue which it was possible for surgery to relieve.

To many who have not studied his work it might appear that he was just a bold surgeon, ready to try any operation on a patient. Nothing could be further from the truth. He was a bold surgeon, but his courage was tempered and guided by careful thought and observation, and all his brilliant operative triumphs were the result of much planning and experiment. Moreover, all his great operations have been justified in the event.

As an instance of the originality of his thoughts and of how much he was in advance of his times the following account of a case is of great interest. The operation was only a minor one but its importance at that time needs no comment. I know of no printed publication of the case, but found these short notes written in pencil at the end of one of his manuscript museum catalogues in the Royal College of Surgeons. The case appears to give him priority in the free grafting of autogenous skin.

Copy of a curious and valuable paper.

> Hartfield, a young man admitted into Guy's Hospital (Cornelius ward) April 9th, 1817, with a diseased thumb which Mr. Cooper, now Sir Astley, amputated between the phalanges on the 18th July.
>
> He then cut off a healthy piece of integument from the amputated part and applied it to the piece of the stump where he secured it by means of adhesive slips.
>
> *1st week to July 25.* Union seems to have taken place.
>
> *2nd week to August 1.* Mr. Cooper proved the vascularity of the newly attached portion by pricking it very slightly with the point of a lancet which produced blood as readily as from any other part of the limb. Sensibility has not yet returned.

3rd week from operation. In the course of this week sensation was restored in the end of the stump.

September 23rd. The stump appears quite well.

This clever and scientific piece of work sprang from the surgical genius of the same mind that was to conceive and plan the execution of those truly major operations of ligation of the carotid artery, ligation of the abdominal aorta, amputation at the hip-joint. Earlier in this chapter we read that Sir Astley Cooper was

> certainly one of the best operators of the day, and *this must be taken in its widest sense, for it is intended to include the planning of the operation, the precision and dexterity in the mode of its performance and the readiness with which all difficulties were met and overcome.*

From the account of some of his special contributions to operative surgery to be described in the next chapters, the truth of these words will be amply appreciated.

CHAPTER IX

ASTLEY COOPER AND ARTERIAL SURGERY

ASTLEY COOPER'S indefatigable energy and enthusiasm led him to adorn so many aspects of the developing surgery of the early nineteenth century that it is almost invidious to single out one special sphere of achievement. His contributions to arterial surgery are, however, so outstanding that they invite separate description. The value of his work in this field was stressed in a special number of the *Guy's Hospital Reports*, published on the centenary of his death (1941). The first issue of the *Reports* in 1836 contains a long and important paper on his researches into the effects of ligation of the carotid and vertebral arteries in dogs, and also an account of the end-results of two of his earlier outstanding cases. Both of the patients had been operated upon by him in the theatre of Guy's on the same day, June 22nd, 1808; in one he tied the external iliac artery for femoral aneurysm and in the other the common carotid for carotid aneurysm. The first patient survived eighteen years and the second thirteen years. In each a post-mortem was obtained and the findings were recorded in the *Reports*.

Astley Cooper had seen much of John Hunter and not only appreciated his worth but admired him greatly; he was full of praise of Hunter's contribution to arterial surgery of proximal ligation for aneurysm as is amply shown in one of his lectures, in which he refers to "the transcendent talents of that immortal genius Mr. John Hunter". Although Hunter was the first to suggest and practise simple proximal ligation, there is no doubt that Astley Cooper did more than any other surgeon to expand, extend and consolidate the application of the principle. His first animal experiment was a study of the effect of femoral and brachial artery ligation on a dog and was done when he was still a student (1786); the dog was afterwards sacrificed and injected so that the collateral circulation could be studied. He stresses in his lectures that he taught only those things that he himself had observed or proved; whenever possible he demonstrated the truth of his teaching by direct experiment. Thus he used to tie both carotid arteries in a dog at his surgical lectures in order to demonstrate that no cerebral harm resulted. His observations over many years are put together in the first number of the *Guy's Hospital Reports* mentioned above, and he was able to prove that in the dog, with its smaller cerebral hemispheres, the vertebral arteries are more essential for the nutrition of the brain than the carotids, which are concerned more with nourishment of the external structures. He demonstrated that ligation of both vertebral arteries was usually fatal in dogs, but not ligation of both carotids. After ligation of both carotids he showed that compression of the vertebrals caused "death", but the animal would recover if the pressure was released. He showed that it was safe to tie the carotid and vertebral on the same side, and, finally, he actually had one dog survive after he had tied both carotids and both vertebrals. This animal became a good house-dog, and after nine months he had it killed and injected it. The collateral circulation is beautifully displayed in the coloured plates illustrating his article. The specimen itself is still preserved in the museum of the Royal College of Surgeons, with other specimens illustrating the same paper. The importance of anastomotic circulation was amply shown by this and other experiments of his and he deserves full credit for it. In the first volume of the *Medico-Chirurgical Transactions* (page 259) he says that he took a healthy dog which had been used for the demonstration of a bilateral carotid ligation at his surgical lectures and made ligatures upon both femoral arteries; when the wounds had healed he tied one brachial artery and later the other. The animal survived these different experiments and lived for more than a year afterwards.

LIGATION OF THE CAROTID ARTERY

Astley Cooper's interest in carotid ligation had been paramount and he was soon able to apply the operation to man, it being usually stated that he was the first surgeon to do so. Keevil (1949), however, has recorded an earlier operation, done for secondary haemorrhage following cut throat, by David Fleming, a naval surgeon, on October 9th, 1803. His first patient died of pressure on the pharynx and trachea by inflammation and suppuration of the aneurysmal sac, but his second case, operated on three years later, was successful. Both cases are reported in the first volume of the proceedings of the new Medico-Chirurgical Society which first met in January 1806. In reporting the first case he depicts a specimen of occlusion of the common carotid artery by pressure from an aortic aneurysm found in a man in the post-mortem room at Guy's. Since no cerebral symptoms had been present during life Astley Cooper considered that this gave additional justification for deliberate ligation of the artery.

The following is a brief description of the two cases:

> Mary Edwards, aged 44, was brought to my house by Mr. Robert Pugh of Gracechurch-street, that I might examine a tumour in the neck which was obviously an aneurism of the right carotid artery. I advised her to become a patient in Guy's Hospital, and she was admitted on the 23rd of October, 1805. The account she gave of the disease was that the tumour appeared five months before, situated rather above the middle of the neck; its size at first being only that of the end of the finger; that it beat with very great force, and occasioned a strong pulsation in the brain; that it gradually increased upwards until it reached the lower jaw, and extended downwards below the middle of the neck.
>
> Upon examination of the swelling I found that it occupied two-thirds of the neck; it had a very strong pulsatory motion, and the skin was thin at its most prominent part. When the swelling was examined at the hospital, great doubts were entertained if there were sufficient space between the clavicle and the tumour for the application of a ligature, and as her husband objected to the operation she quitted the hospital.
>
> In a few days, hearing that all her symptoms were increased, I called at her house, and strongly pointing out the probability of a fatal termination of the disease, I gained her consent and that of her relations to an operation.
>
> On Friday, Nov. 1st, 1805, the operation was performed. . . . As soon as the threads were tied, all pulsation in the tumour ceased, and the operation being concluded, and the wound superficially dressed, she rose from the chair in which she sat during the operation, and was immediately seized with a fit of coughing, which I thought would have terminated her existence. This seemed to arise from an accumulation of mucus in the trachea which she could not expel; it continued about half an hour when she became more tranquil.
>
> . . . *Tuesday, Nov.* 5. In the afternoon, I found her, as may be supposed contrary to my orders, sitting before the fire with three other persons, drinking tea, which she swallowed with great difficulty; she had no pain

> in her head; her pulse 96, and the only circumstance of which she complains is that her cough is troublesome. . . .
>
> Thursday, Nov. 21 she died.

Autopsy revealed suppuration in and around the large sac and fatal compression of the larynx and trachea. The specimen from this case used to be preserved in the museum of St. Thomas's Hospital. A water-colour painting of it may still be seen in a volume of collected drawings bound by him in 1814 and preserved in the library of the Royal College of Surgeons.

Astley Cooper concluded that to succeed it was important to do the operation before the sac had grown so big. His opportunity came nearly three years later.

> Mr. George Young, surgeon, had the kindness to furnish me with a case of the most favourable nature, by sending, first to my house and afterwards to Guy's Hospital, a man who was in all respects the subject I should have chosen. He had a mind cool and firm, yet obedient to every injunction; a body equally unirritable as his mind—the tumour only about two inches and a half in diameter, and the neck of considerable length, so as to give ample space for exposing the carotid artery. The history of this case is as follows:
>
> > Humphrey Humphreys, aged fifty, who has been employed to carry loads of iron as a porter, observed six or seven months ago a tumour, having pulsatory action, and about the size of a walnut on the left side of the neck, just under the angle of the jaw, and extending from thence downwards to the thyroid cartilage. It was accompanied with great pain on the left side of the head, which began about five months ago, and was attended with a sense of pulsatory motion in the brain. The tumour affected his speech, so as to make him extremely hoarse; and he had more recently a cough, attended with slight difficulty of breathing, and which seemed to be the effect of the pressure of the swelling on the larynx. . . .
>
> The dilation of the carotid artery was seated just below the angle of the jaw, and about the acute angle which is made by the great division of the common carotid. The tumour was about the size of a pullet's egg, and prominent in the middle. . . .
>
> I proposed to tie the common carotid below the dilated part, and the operation was performed at one o'clock on the twenty-second of June 1808, at Guy's Hospital. . . .

> A blunt iron probe constructed for the purpose was then passed under the artery, carrying a double ligature with it. Two ligatures being thus conveyed under the artery the lower was immediately tied. I next detached the artery from the surrounding parts to the extent of an inch above the lower ligature, and then tied the upper. Lastly, a needle and thread were passed through the artery above one ligature and below the other. The division of the artery was then performed.
>
> Nothing now remained but to dress the patient, and this was done by drawing the parts together by adhesive straps, the ligatures hanging from each end of the wound, and by laying on a piece of lint retained by straps of adhesive plaster.
>
> Mr. Vose, my dresser (whose attention to the case was unremitted, and to whose care and knowledge many of my patients have been indebted for their recovery), now asked the patient if he experienced any unusual sensations about his head. He answered that for the first time since two months after the formation of the tumour, he was relieved from a distressing pain which extended up the left temple, accompanied by a violent throbbing of all the arteries of that side. This pain never returned. . . .
>
> The man was discharged cured, on the 14th day of September, and returned to the occupation of a porter at Crawshay's iron wharf, Thames-street.
>
> The result of this case afforded me a degree of pleasure which compensated for the disappointment I felt in the issue of the former. In a professional point of view, it was highly desirable to ascertain the possibility of saving life in a case which had hitherto proved generally fatal; and I could not but feel more than common interest in the fate of a man, who, although he well knew that the trial was new, and the risk considerable, never betrayed the smallest signs of apprehension.
>
> Near eight months have now elapsed since the operation was performed, and he has returned to his former employment without any diminution of his mental or corporeal powers, excepting the lessened action of the temporal and facial arteries on the side in which he was operated. The tumour has disappeared, and he has not been since subject to that pain in the head, by which he had been so much distressed prior to the operation.

This man survived until 1821 (thirteen years) when he died of a cerebral haemorrhage on the left side, that of the original carotid ligation. As Astley Cooper himself remarks in his report of the post-mortem in the first number of the *Guy's Hospital Reports*:

> The disease of which he died sufficiently attested the freedom of the

circulation, as well as its force in the cerebral vessels on the side on which the carotid had been tied.

LIGATION OF THE EXTERNAL ILIAC ARTERY

On the afternoon on which he operated upon the last case, Astley Cooper also performed a ligation of the external iliac artery for a large femoral aneurysm. The patient, a man of thirty-nine, made a good recovery, only complicated by infection of the sac and external discharge of its contents. The operation was reported in the fourth volume of the *Medico-Chirurgical Transactions* (1813).

He died in 1826 (eighteen and a half years later) and Cooper, at considerable expense, secured the body and it was injected and dissected by Edward Cock. An account of the findings with particular reference to the collateral circulation, is given in the *Guy's Hospital Reports* (1836) with the excellent diagrams which are here reproduced (Plate 3). The actual specimen, dried and varnished, can still be seen in the Gordon Museum as fresh as the day it was completed. A remarkable monument to a remarkable case this is only to be compared with a similar specimen, also to be seen in the museum, of Aston Key's case of ligation of the subclavian artery in 1823 for axillary aneurysm (the first successful case in London). The patient survived for twelve years and the specimen was likewise injected, dissected and mounted by Edward Cock and described in the same number of the *Reports*.

In his surgical lecture Number 22 Astley Cooper tells us that he ligated the external iliac artery for femoral aneurysm nine times: "one of the patients is a surgeon, who has since married, and is extremely well". His association with the operation is commemorated by the attachment of his name to the classical incision used for extraperitoneal exposure of the vessel.

EXPERIMENTS ON TEMPORARY LIGATION OF ARTERIES

In Astley Cooper's time the current method of arterial ligation was to use a long silk ligature, one or both ends of which were allowed to hang out of the wound until spontaneous separation occurred about 10–14 days later. This phase was, of course, an anxious one, being often accompanied by secondary haemorrhage which was not infrequently fatal. In an attempt to avoid this Cooper investigated the feasibility

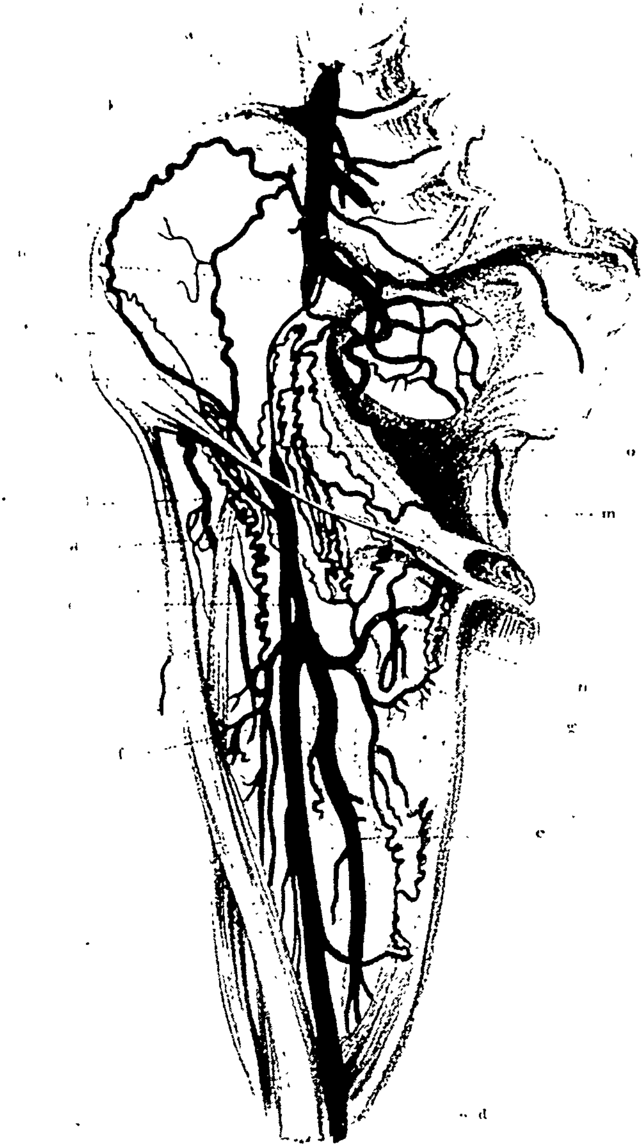


PLATE 3A

Injected and dissected specimen to show the collateral circulation after ligation of the external iliac artery for aneurysm. The patient lived for eighteen years after operation. The specimen is in the Gordon Museum at Guy's Hospital. *See also Plate* 3B *overleaf.*

[To face page 54

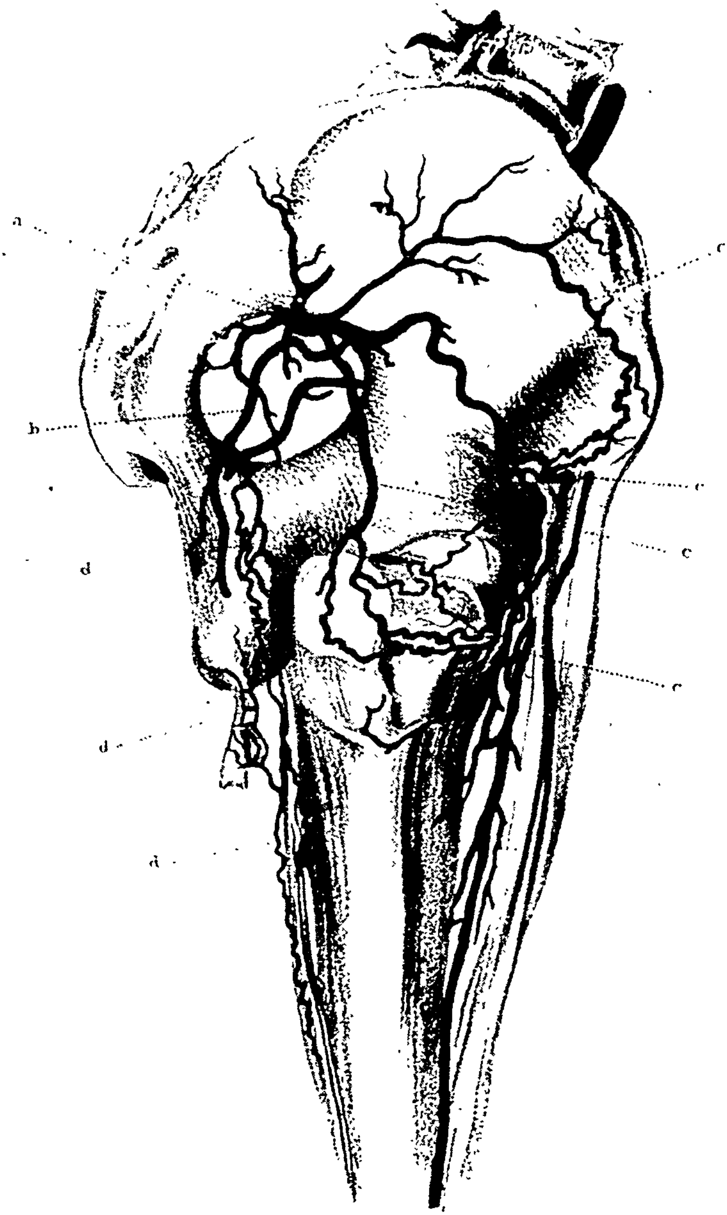


PLATE 3B

of temporary ligation, as it had been suggested from animal experiment by a Dr. Jones that if a fine ligature were applied for a few hours only, obliteration of the artery would occur by thrombosis. He first placed a fine ligature on the femoral artery, tied it tightly and in a few hours removed it. The pulsation was stopped for a short time but in a few hours it returned. The artery was then tied in the usual way. He next tried the method on a case of popliteal aneurysm and left a fine ligature tied tightly on the femoral artery for 30 hours; the pulsation returned and so he tightened the ligature again and allowed it to remain 42 hours longer, and then removed it; thus it required a total of 72 hours to obliterate the artery. In spite of this the patient developed a severe secondary haemorrhage on the thirteenth day. His last attempt with the method was on an aneurysm of the radial artery; the ligature was left tied for 24 hours, but the pulsation returned and he performed proximal and distal ligation.

From these experiences he concluded that the use of temporary ligatures to secure permanent arterial occlusion was unsatisfactory and ought to be abandoned. He did not, however, abandon his search for a safe method of arterial ligation as will be seen by the story of his other experiments and observations which will be given later and which follow as a natural sequel to the story of what is perhaps the most remarkable episode of his whole career—his ligation of the abdominal aorta.

LIGATION OF THE ABDOMINAL AORTA

Even to-day ligation of the abdominal aorta is a procedure the feasibility of which is bound to rouse scepticism in the minds of many. The occasions for its application are so rare, the justifications so few, and the results so precarious that this is not to be wondered at. Probably many do not even know that it is an operation that has been done successfully. The first reaction to Astley Cooper's attempt is likely to be one of mistrust, and it is easy to think that it was just the grandiose gesture of an impetuous surgeon possessed of poor consideration for his patient.

Nothing could be further from the truth, as the full story of the episode shows. There is no doubt that this operation marked the culmination of both his experimental and practical work on arterial surgery and was performed only when a suitable case presented itself after years of study. His knowledge of the sound philosophy and careful experiment that had led him to decide on the attempt gave the necessary justification to his surgical genius.

In June 1811 Astley Cooper gave an account before the Medico-Chirurgical Society of his experiences of collateral circulation after ligation of a main artery, chiefly in support of his operation in man of carotid artery ligation; but in order to stress the efficacy of the bodily readjustment to arterial occlusion he says: "Lastly I was anxious to ascertain when even the aorta was tied if the blood would still find its course by anastomosis." He then tells how he had succeeded in tying the abdominal aorta in a dog which survived; some degree of weakness was produced in the "hinder extremities but it was not sufficient to prevent the animal from using them with great freedom and would scarcely be observed by one who knew nothing of the experiment". He showed two specimens from dogs, in one of which the collateral circulation was displayed by injection. Two specimens from this series of experiments may still be seen in the Gordon Museum of Guy's; one of these is a beautifully injected, dried and varnished specimen which is said to be from his first successful case (Plate 4). It has been dated 1814, but as in 1811 he says his first success was two years before, it would be more correctly dated 1809.

Having successfully demonstrated that the healthy dog would tolerate ligation of the aorta, Cooper turned to human morbid anatomy for information. In his *Surgical Essays*, published in 1818 and written in conjunction with Benjamin Travers, he points out that the aorta is so rarely obstructed that the opportunity of ascertaining the power of anastomosing vessels in propelling the blood is extremely infrequent. He then described three cases, one dissected by himself, which were examples of what is now called coarctation of the aorta and in which he had studied the collateral circulation. He was unable to find any examples of obliteration or contraction of the abdominal aorta in man but points out that if such an event were to occur, little difficulty could arise in the transmission of blood by the collateral channels; the mammary and epigastric, the superior and inferior mesenterics and the lumbar vessels would furnish abundant opportunity for this.

In June 1817 the opportunity arose for application of his observations and experiments to a human case. The *Surgical Essays* mentioned

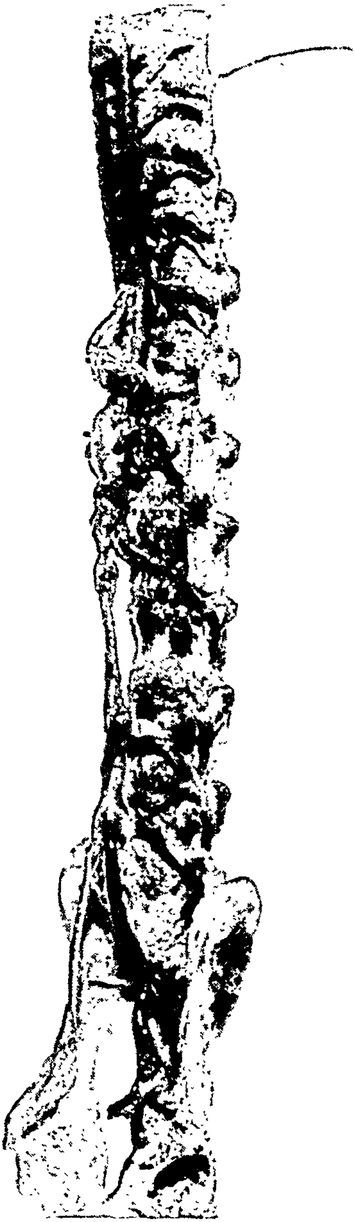
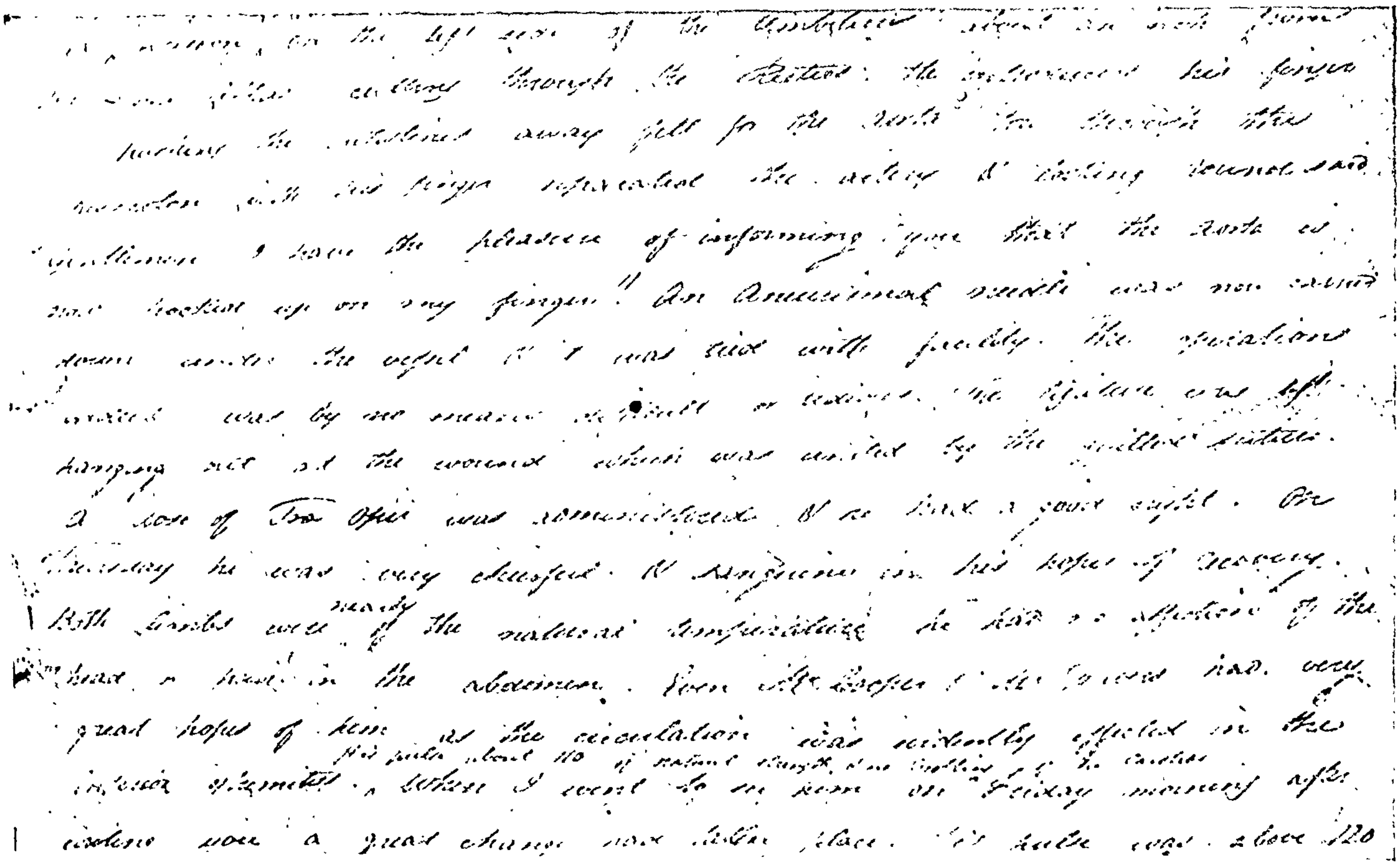


PLATE 4

Astley Cooper's first successful ligation of the aorta in a dog. The specimen is in the Gordon Museum at Guy's Hospital.

[To face page 56



[illegible], on the left side of the [illegible] [illegible] [illegible] [illegible] [illegible]
[illegible] [illegible] [illegible] cutting through the [illegible]: the [illegible] his finger
pushing the intestines away felt for the Aorta [illegible] [illegible] after
[illegible] with his finger [illegible] the [illegible] of [illegible] round [illegible].
Gentlemen I have the pleasure of informing you that the Aorta is
now tied up on my finger!" An [illegible] [illegible] was now [illegible]
[illegible] [illegible] the [illegible] [illegible] I was [illegible] with [illegible]. The operation
[illegible] was by no means [illegible] or tedious. The ligature was left
hanging out at the wound which was united by the [illegible] suture.
A dose of [illegible] Opii was administered. [illegible] [illegible] [illegible] a good night. On
Thursday he was very cheerful. [illegible] [illegible] in his hopes of recovery.
Both limbs were nearly of the natural temperature he had no affection of the
head or pain in the abdomen. [illegible] [illegible] [illegible] [illegible] [illegible] had very
great hopes of him as the circulation was evidently effected in the
His pulse about 110 of natural strength and [illegible] [illegible] the [illegible]
[illegible] [illegible], [illegible] I went to see him on Friday morning after
[illegible] you a great change [illegible] taken place. His pulse was above 120

PLATE 5

Part of a description written by a student, Edward Osler, who was present at the operation for ligation of the aorta in man. The original is in the Library at Guy's Hospital. It was presented by Sir William Osler, nephew of Edward Osler.

above contains the best account of the case and is the source of the present description. While searching in the Wills library for information and material for this biography I was fortunate enough to find a unique document, an account of the operation written on July 5th, 1817, by a student who was present. This student was Edward Osler and the letter was presented to the Hospital in 1917 by his nephew, Sir William Osler. An account of the document will be found in the *Guy's Hospital Gazette* for 1911, page 277. This letter contains certain additional observations of great interest, although various details of the case differ somewhat from Astley Cooper's account.

The patient, Charles Hutson, aged thirty-eight, was admitted to Guy's Hospital on April 9th, 1817, with an iliac aneurysm which formed a large mass extending both above and below Poupart's ligament on the left side. It began about twelve months before and had gradually increased. Three days after admission the lump suddenly doubled in size and after a few more days enlarged still further. According to Edward Osler:

> towards the end of May every part was very hard except one spot, which was soft and fluctuating like an abscess. About the middle of June a line of ulceration began to appear, which extended, and at last formed an eschar as large as a crown piece.

Astley Cooper says that bleeding started on June 20th and recurred on the 22nd, 24th and 25th; the last time so profusely that dissolution was only prevented by his apprentice, Aston Key, applying pressure. Osler's account of the incidents leading up to the operation is most revealing; he says:

> On the 24th of June (Tuesday) Cooper saw him. After he had looked at him he sat by his bedside for a few minutes buried in thought, without speaking to anyone. At last he started up with a smile (you know his look!). "I'll do it, but I'll wait for haemorrhage." He had not long to wait. On Wednesday afternoon the patient lost eighteen ounces of blood and Cooper was sent for.

It is clear that Cooper had foreseen the probable need for ligation of the aorta, for two days earlier he had gone to the post-mortem room and exposed the aorta retroperitoneally through a lateral incision; finding this "utterly impracticable" he made an abdominal incision and exposed it transperitoneally.

Cooper saw the patient at 9 p.m. on June 24th and first tried to secure the feeding vessels by a lesser method, which had often been successful with aneurysms, of opening the sac, plunging a finger in the entering artery and then tying it; but this proved useless as the sac was large and no normal vessel could be reached.

> As I was quitting the patient's bed I felt a great regret, in which all the students by whom I was surrounded joined me, that the patient should be left to perish without giving him the only chance which remained of preventing his immediate dissolution from haemorrhage, by tying the aorta; and I therefore said: "Gentlemen, this only hope of safety I am determined to give him." He then explained the position to the patient, who said: "Sir, I leave myself in your hands."
>
> A three-inch incision skirting the umbilicus was made through the linea alba; with the finger the peritoneum was scratched through on the *left side of the aorta, and worked under the vessel to the right* and *again* through the peritoneum.

Edward Osler adds a dramatic touch to his description of this moment in the operation; he says that Cooper, "looking round, said, 'Gentlemen, I have the pleasure of informing you that the aorta is now hooked upon my finger'" (Plate 5). The artery was tied by a silk ligature which was left hanging out of the wound which was united by a "quilled suture".

The patient complained of but little pain during the operation and at 1 p.m. the next day when Cooper visited him he was sitting up in bed, cheerful and comfortable. At noon on this day the temperature of the right limb was 97°, that of the left, or aneurysmal limb, 87·5°.

Osler records:

> He had a good night and on Thursday he was very cheerful and sanguine in his hopes of recovery. Both limbs were nearly of the natural temperature; he had no affection of the head or pain in the abdomen. Even Mr. Cooper and Mr. Travers had very great hopes of him. His pulse was above 110, of natural strength. When I went to see him on Friday morning, a great change had taken place . . . his left leg was cold, as were his extremities. He had passed a restless night and had slept very little. At one o'clock he died.

Vomiting had come on during the Thursday afternoon and death occurred forty hours after the operation; the right limb had recovered its warmth and sensation, but the left was livid and cold.

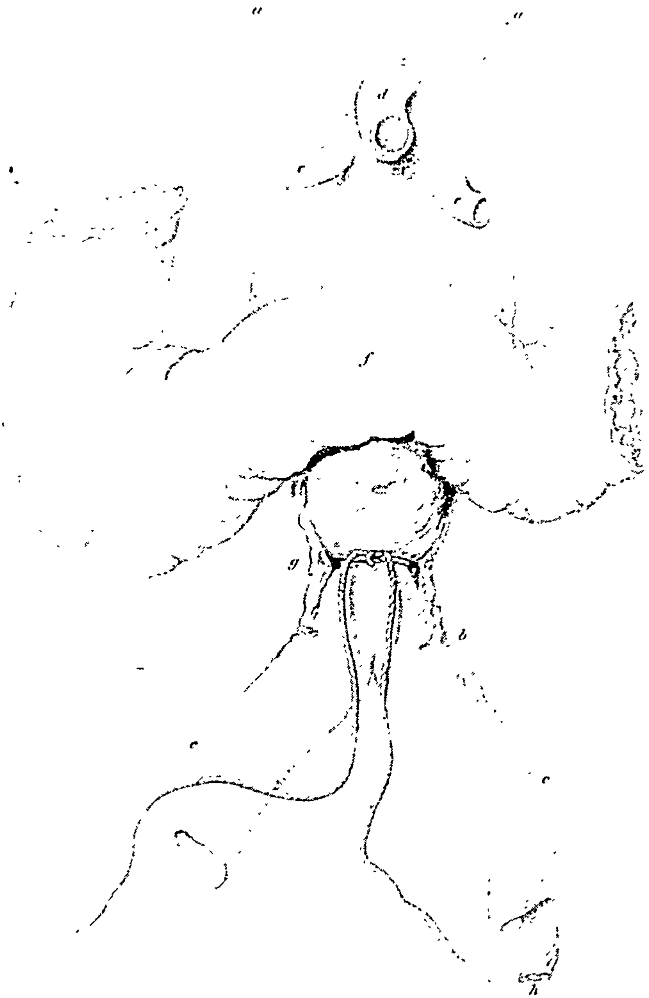


PLATE 6A

The specimen from Astley Cooper's case of ligation of the aorta in man. It is in the Museum at St. Thomas's Hospital. *See also Plate* 6B *overleaf.*

[*To face page* 58

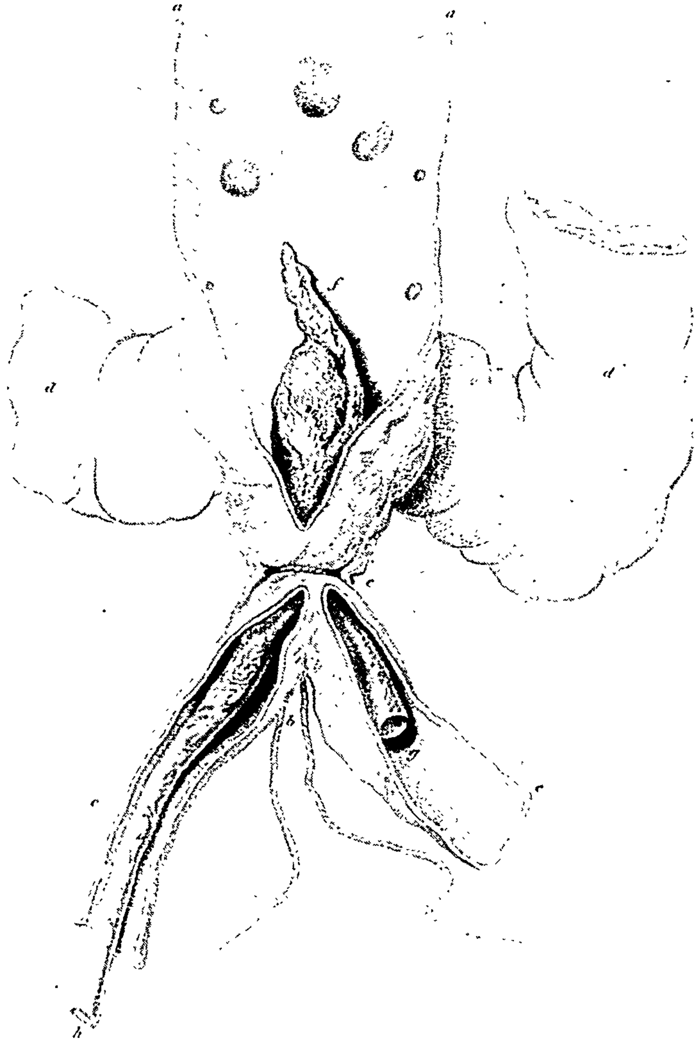


PLATE 6B

At the autopsy it was found that the ligature had been perfectly tied round the aorta about three-quarters of an inch above its bifurcation without injuring or occluding any other structure in the abdomen. Cooper says that there was "not the least appearance of peritoneal inflammation, excepting at the edges of the wound". On opening the aorta a clot of more than an inch in extent was found to have sealed the vessel above the ligature; below the bifurcation, another an inch in length occupied the right iliac artery, and the left was sealed by a third which extended as far as the aneurysm (Plate 6). The specimen, like so many of Astley Cooper's, remained in the museum of St. Thomas's Hospital when the United Hospitals separated, and is still in that museum.

Astley Cooper felt that death was due to want of circulation in the aneurysmal limb,

> for although the life and warmth of the other limb was preserved, that on which the aneurism was seated never gained its natural heat, which must have arisen from the great bulk of the aneurism and the disturbed state of the coagulum which it contained which would prevent the free course of the blood through the sac. That limb never recovered its natural heat, there being seven degrees difference between the two extremities; the sensibility also in the right limb was returning, which did not appear to be the case in the left.

It is unfortunate that this first case should have been such a late, neglected one, just as happened in his first case of carotid artery ligation. He said that in another such case he would apply the ligature before the swelling had acquired any considerable size.

Unfortunately the opportunity did not come to him again, although the operation was repeated by James in 1829 and by Murray in 1834; both cases were unsuccessful, but in 1842 a patient operated upon by Monteiro survived for ten days, only to die of secondary haemorrhage. Rowlands and Turner (1927) in discussing ligation of the aorta say: "As life was here prolonged for forty hours, and as in Monteiro's case death did not take place till the tenth day, proof is given of the restoration of the collateral circulation."

Reid (1926) in recording all the cases of aneurysm ever treated in the surgical service of the Johns Hopkins Hospital up to January 1922, states that there were seven ligations of the aorta for five patients.

Metallic bands and broad tapes were used. Three ligatures were above the diaphragm, one complete and two partial. The abdominal aorta was completely occluded once and partly occluded three times. All five patients died, the longest survival being for 134 days.

The final justification of Cooper's work is given by Matas (1925), who reports a successful ligation of the aorta for an aneurysm at its bifurcation; the patient died of pulmonary tuberculosis 1 year, 5 months and 5 days after the ligation.

The account of this operation can be closed in no better way than giving Erichsen's comment:

> *It is impossible not to contemplate with admiration the man whose* mind was the first to conceive and whose hand was the first to carry out the determination to apply a ligature to the abdominal aorta; and who guided by pathological observation and physiological experiment, thus to arrest at once the circulation through the main channel of supply to the lower half of the body.

FINAL EXPERIMENTS TO IMPROVE METHODS OF ARTERIAL LIGATION; THE USE OF CATGUT

The account of Astley Cooper's contributions to arterial surgery might well stop at the dramatic height just reached, but work still remains to be described that is no less fundamental. Although it did not proceed to a useful conclusion in his day this was not because of any lack of imagination or scientific inquiry on his part but because the time was not yet ripe for the revelation that would have made the work successful. It was not until Lister's day that the barriers to safe arterial ligation were removed; the brilliance and complete success of Lister's work has plunged so much earlier observation and experiment into obscurity that it is important, and certainly only fair to Astley Cooper, that we should recall the efforts which he made. Few surgeons are even aware of the shrewd, penetrating observations and experiments made by him in seeking for a safe method of ligation of vessels. It is generally known that Lister introduced the modern use of sterilised catgut, but it is not so well known that Astley Cooper suggested and actually used catgut fifty years earlier.

In Godlee's life of Lister, and in numerous other accounts of his work, no mention whatever is made of earlier attempts to use catgut and, indeed, the impression is gained that Lister was the very first to use it. To him alone belongs the credit for our ability to use it to-day with safety, and he unquestionably did far more accurate, intensive, prolonged and fruitful research on its use than any other surgeon; as Godlee says:

> his experiments on catgut lasted throughout the whole of his active professional life; indeed, the very last note in what he called his "commonplace book" dated July 25th, 1899, breaks off in the middle of an account of a complicated research into the relative antiseptic properties of two kinds of prepared catgut. . . .

Astley Cooper, however, as a result of logical argument, used a buried catgut ligature to tie a main artery in 1817. The natural process of his thoughts on this subject is made evident by a consideration of certain problems arising out of the operation of ligation of the aorta. That the dangers of peritonitis were in his mind is shown, not only by his investigation of an extraperitoneal approach to the aorta but also by his written word in discussing the disadvantages of leaving the ends of the ligature hanging out of the abdomen. Thus he points out that it is necesssary to consider what to do with the ligature; should it be left suspended from the wound, or cut off close to the vessel? He recognises quite clearly that "although the patient did not suffer from inflammation of the abdomen, yet I should much fear that if he had lived longer, an extraneous substance suspended amidst the intestines would have produced that effect". Also, "It has occurred to me that catgut would answer the purpose better as, being animal matter, it would be more easily absorbed than silk." Then in an addendum to the surgical essay on ligation of the aorta he reveals that he has since used with success catgut which had been previously soaked in water about the temperature of 100°. The patient, William Heydon, was an old man of eighty suffering from a popliteal aneurysm who was operated on at Guy's Hospital on October 15th, 1817. Astley Cooper tied the femoral artery *using a catgut ligature, cut the ends short, and closed the wound*; it healed by primary intention and the patient was cured.

He adds:

> The case gave me much pleasure, and the rapid recovery leads me to hope that the operation for aneurism may become, at some future period, infinitely more simple.

This again shows the penetrating clearness of his reflections and conclusions. He is careful to point out that he considered the subject "at present undecided and only as one for future investigation".

In his published surgical lectures, however, he tells us of more of his experiences.

> It would be an extremely desirable thing if any person invented a ligature composed of materials which would admit of solution; he would, by such invention, greatly service his profession.

He then goes on to say that although he had thought that catgut would do and was successful in the first case, the next three times he used it it came away by suppuration and ulceration just as the common silk ligature did. Not content with this he did some experiments on dogs to ascertain the solubility of catgut. He tied the carotid of a dog with catgut, killed the animal a fortnight later, and found that the ligature had not been dissolved but that it had cut through the artery and was encysted; "therefore this substance does not admit of solubility, but will remain sometimes without producing irritation. On the whole, catgut ligatures are not at all superior to the common ones. At present there is no ligature known which is capable of being dissolved and removed by absorbents".

It is easy to-day to see the answer to his problem; Lister supplied us with that. It is certain that both by argument and by experiment he went as far as a man could go in those days before the cause of wound infection and all that followed it was understood.

On what a Great Divide he stood but could not pass beyond! Godlee's words in Lister's biography (page 237) show this well:

> Conversation to-day with young surgeons of inquiring minds shows that they do not know that it was the introduction of the absorbable ligature which did away at a stroke with the old plan of leaving the long ends of the threads hanging out of the wounds, and that they are also unaware that this clumsy practice persisted up to the moment when catgut came into general use. If this historical fact has been so soon forgotten it is important to state it plainly here, lest our successors should not only be ignorant of it, but unable to believe it.

Although Lister introduced the antiseptic catgut ligature and used it with success on a calf in 1868, Godlee (page 253) states that the first surgeon to use catgut for tying an artery in its continuity in man was

Mr. Bickersteth, of Liverpool, an enthusiastic follower and friend of Lister. On April 20th, 1869, Bickersteth wrote:

> This day fortnight I tied the carotid artery (for aneurysm) with the antiseptic catgut ligature—cut off both ends—and the wound healed *without one drop of pus* in about 7 days. I think I am the first who has succeeded with the catgut ligature on the human subject.

This is incorrect, for Astley Cooper succeeded exactly fifty-two years earlier.

But even Astley Cooper was not the first. In the Medical Research Council's booklet on "The preparation of catgut for surgical use", Bulloch (1924) reviews its early use and reveals that the first written reference is by Galen (*d.* A.D. 201), who says:

> In many places under Roman rule wealthy women have silk, especially in large cities, but if there is no such opportunity choose from the material where you are living the least putrescible, such as thin catgut which quickly falls from the vessel.

There is no doubt that it was in use even before Galen's time. Bulloch then states that the credit of re-introducing catgut is usually given to Philip Syng Physick, of Philadelphia, who experimented with various absorbable materials, including catgut, in 1816. (An account of his work is given in his biography by Randolph (1839); a book which is easier of access than the original journal.) He then goes on to say: "It was possibly the knowledge of Physick's observations which had led Astley Cooper in 1817 to use catgut as a ligature for the popliteal artery. The case, which is historic . . . took place at Guy's Hospital."

I can see no justification for Bulloch's suggestion that Astley Cooper's admittedly historic operation followed his knowledge of Physick's experiments. He had no reluctance in referring to the work or priority of others and, in the very paper in which he first mentions the operation, he seeks to justify his proposal of cutting the ligature short by adding a postscript quoting several cases of other authors in which vessels had been tied with silk and the ligatures cut short close to the knot. If he had known of Physick's work he would have mentioned it if only to support his own practice. There can be no reasonable doubt that to him alone belongs the credit for the successful re-introduction of the use of catgut in arterial ligation, although it was not until Lister's first paper in 1869 that its success became assured.

ARTERIAL SURGERY AND VALENTINE MOTT

It is impossible to leave Astley Cooper's contribution to arterial surgery without mentioning his associations with and obvious inspiration of Valentine Mott. It is not generally known that this great American pioneer in arterial surgery was both a pupil at Guy's Hospital and a dresser attached to Sir Astley Cooper. A brief account of his life and work is given elsewhere (Brock, 1945). After graduating in New York he visited Europe, and from the records in the Medical School office it can be seen that he registered as a pupil at Guy's Hospital on August 31st, 1807. He remained at Guy's for six months, and there can be no doubt of the profound impression made upon him by his observation of Astley Cooper's work, especially in arterial surgery. His chief interest lay in the surgery of the main arteries and the greatest of his earlier operations, and one which gave him an international reputation at once and on which his fame rests most securely to-day, was the first ligation of the innominate artery. This operation, formidable even in these days of asepsis and anaesthetics, was performed in May 1818. Again, like Astley Cooper's great operations of arterial ligation, it did not proceed from an impulse or from unbalanced surgical enthusiasm. It was well thought out and he himself has left it on record that he had had the operation in mind for many years. His patient, a man of fifty-seven, unfortunately died on the 26th day from secondary haemorrhage following sepsis. Mott, however, had the great satisfaction of knowing before he himself died that the operation had been successfully performed on man with survival. This was Smyth's case from New Orleans, operated upon in 1864, nearly half a century after Mott's pioneer attempt.

In 1827 Mott performed the first successful ligation of the common iliac artery. He was not only the father of arterial surgery in America, but can justly be said to have performed ligation of the great arteries more often and successfully than any other surgeon in history. The catalogue, including the case of the innominate ligation, comprises 8 examples of ligation of the subclavian artery, 51 of the common carotid, 2 of the external carotid, 1 of the common iliac, 6 of the external iliac, 2 of the internal iliac, 57 of the femoral and 10 of the popliteal; in all 138 (Gross, 1868).

Astley Cooper's inspiration of Valentine Mott led to many parallels between the life and work of the two great men, and this connection between the great American and the great English surgeon and between the great schools of surgery on each side of the Atlantic is even more happily recalled to-day.

As a token of the regard in which these two men held each other we learn that on Mott's last visit to London, when he called upon Sir Astley Cooper before he left for home, Astley Cooper presented him with a fine case of instruments of his own design as a token of his friendship and regard.

CHAPTER X

AMPUTATION AT THE HIP-JOINT

ON January 15th, 1824, Sir Astley Cooper performed an amputation through the hip-joint, the patient making a successful recovery. Even to-day this operation is a formidable one, and it is only too easy to appreciate its magnitude in those days before antiseptics and general anaesthesia; it is questionable whether the surgeon or the patient needed the greater courage in facing the task. Although it was not the first operation of its kind, nor even the first successful one, it occasioned great interest throughout Great Britain, and not a little controversy in the medical press. Mr. Nils Eckhoff, writing in the *Guy's Hospital Reports*, 1939, took the opportunity to give an account of this operation while presenting the interesting lithograph, reproduced here, of the actual patient, which had come into his possession. This lithograph may be seen in the Museum of Antiquities at Guy's Hospital. Mr. Eckhoff's article has been freely drawn upon for this account of the operation and the comments which it aroused. The operation was originally described in the *Lancet* of January 18th, 1824, that is, two days after its performance, and was alluded to again in later numbers; the report in the *Lancet* is as follows:

> Guy's Hospital
> January 16th, 1824
> Amputation at the Hip-Joint
>
> This formidable operation was performed here this morning, for the first time, by Sir Astley Cooper, in the presence of some of the surgeons and pupils belonging to these institutions. The number of those present, however, was not so great as on many other occasions; no previous notice of the operation having been given, owing to its having been determined on but a few minutes before it was performed. The patient is a man about 40 years of age, whose leg had been amputated some few years ago, just above the knee: since which time the thigh-bone has become diseased from the extremity of the stump up to the trochanter major, and this disease has had such effect on him of late, that he has been rapidly sinking under it. The thigh was of the middle size. On being asked this morning

to submit to an operation, he readily consented. At half past one the patient was brought into the operating theatre, and placed in the recumbent position on the table. The femoral artery was first cut down upon, and secured about one inch and a half below Poupart's ligament, but it was discovered, by passing the finger deep between the triceps and vastus internus, that the profunda was still pulsating and it was evident the profunda was given off higher than usual, which obliged Sir Astley to secure the femoral artery almost close to Poupart's ligament. Sir Astley, standing to the outer side, with the limb in one hand and the catling in the other, commenced the operation by making an incision just below Poupart's ligament, a little to the iliac side of the femoral artery; this was continued obliquely downwards and outwards to the back of the thigh, about one third of the way down, from which point the knife was carried in the opposite direction, obliquely upwards and inwards to meet the first incision; by this means forming an eliptical curve. The cellular membrane was merely cut through at first, but the knife was again carried in the same direction as before, and thus the muscles were also separated; at this step of the operation it was necessary to apply another ligature on the inside of the limb; here the operator changed positions and sat on the chair in front of the patient, and waited a short time to see whether there were any bleeding vessels. After the lapse of a few minutes, the operation was continued, the head of the thigh-bone being removed from the acetabulum without any difficulty. Two ligatures in addition to those already used were applied, making in the whole four; the integuments were brought together, and a suture applied to the upper portion; strips of adhesive plaster, and lastly a bandage were put over the stump: about 12 ounces of blood were lost, but it had the appearance of being venous. The limb was removed in the space of twenty minutes, the securing of the arteries and the dressings occupied fifteen more; the whole was, therefore, completed in thirty-five minutes. During the operation the man was extremely faint; but some wine being given him and some fresh air admitted, he recovered. The patient bore the operation with extraordinary fortitude; and after all was finished, he said to Sir Astley, 'that it was the hardest day's work he had ever gone through', to which Sir Astley replied 'that it was almost the hardest he ever had'.

This account of the operation is followed by a detailed report of the patient's progress and after-treatment, much of which would be tedious to reproduce here but which well repays reading, especially by those interested to hear of the post-operative management in those days and of the patient's reaction to such a formidable operation. Briefly, recovery was retarded by infection and suppuration in the stump which was relieved by loosening the dressings and strapping which had been used to approximate the skin edges, and by incision of an abscess. On March 19th appears the note: "Gains strength rapidly. Has been out of the ward twice during the past week, and was each time wheeled about the squares of the hospital for a considerable period." In August 1825 the patient had perfectly recovered, and was living at the country residence of Sir Astley Cooper. This alone is a significant observation and helps to throw a light on Sir Astley Cooper's character, that his interest in the welfare of his patient extended so far as to provide convalescence for him in his own country house.

Later pages of the *Lancet* of the same year contain acrimonious and almost abusive letters and comments on the operation, all written in the manner characteristic of the time when undignified and petty disputes and personal criticisms were common. It is to Astley Cooper's credit that he treated these criticisms with the contempt they deserved.

The Edinburgh School, apparently impressed by the operation, was not to be outdone, and the *Lancet* reprinted later in the same year an account in the *Edinburgh Medical and Surgical Journal* of an amputation performed at the hip-joint by Mr. Symes. The operation was done on September 2nd and was completed very rapidly, the actual removal of the limb taking no more than a minute. The *Lancet* says:

> Our attention has been particularly called to this operation, in consequence of its having been alluded to by the Northern journals, for the purpose of casting a shade on the splendour of London surgery; and in doing this our brethren of the north, sarcastically compared the time occupied by Mr. Symes to that occupied by Sir A. Cooper, when he recently performed a similar operation at Guy's Hospital. As regards time, the difference is unquestionably very great, Sir Astley Cooper having required *twenty* minutes to remove the limb, whereas Mr. Symes, according to his own account, was contented with *one* minute.

The *Lancet* then vigorously champions Sir Astley Cooper and pours scorn on Symes's operation, basing its criticism on comparison between the methods of haemostasis in the two operations. Astley Cooper took great care to secure the main femoral vessels as a first step in the operation; Symes paid no attention to bleeding until the limb was off, except that his assistant, Liston, "covered the numerous cut arteries with his left hand and compressed the femoral in the groin by means of his right". As soon as the femoral artery was secured Liston released his hands and then occurred the scene to which the *Lancet* directed so much sharp criticism. Symes writes:

> and then had it not been for thorough seasoning in scenes of dreadful haemorrhage, I certainly should have been startled. It seemed, indeed, at first sight, as if the vessels which supplied so many large and crossing jets of arterial blood could never all be closed. It may be imagined that we did not spend much time in admiring this alarming spectacle. A single instant was sufficient to convince us that the patient's safety required all our expedition; and, in the course of a few minutes haemorrhage was effectually restrained by the application of ten or twelve ligatures.

Not an edifying scene to follow the proud removal of a limb in no more time than a minute, and the *Lancet* did not hesitate to say so and described the circumstances as "truly ludicrous and antisurgical". Symes's patient sank and died from exhaustion seven weeks after the operation.

It is only fair to admire the cool judgment and behaviour of Sir Astley Cooper at this operation. In those days of surgical haste and dramatic speed, understandable in particular at an operation such as disarticulation at the hip-joint, he operated on his patient with perfect deliberation, following precisely the steps that he had previously decided were the correct ones. We even read that he

> changed positions and sat on the chair in front of the patient, and waited a short time to see whether there were any bleeding vessels. After the lapse of a few minutes, the operation was continued.

Even though Astley Cooper was deliberate he was certainly not slow, since the whole operation up to the time the dressings had been applied, took only thirty-five minutes. Few surgeons of to-day would be able to complete the operation in such a short time.

Astley Cooper did not claim priority for the operation but insisted in his teaching that the correct first step of the operation was to secure the main vessels; that he was right in this is shown by the fact that it is the recognised procedure even to-day. In his lectures on the subject he says:

> This operation has been several times performed, and in several instances with success. I recollect the time when this operation was a

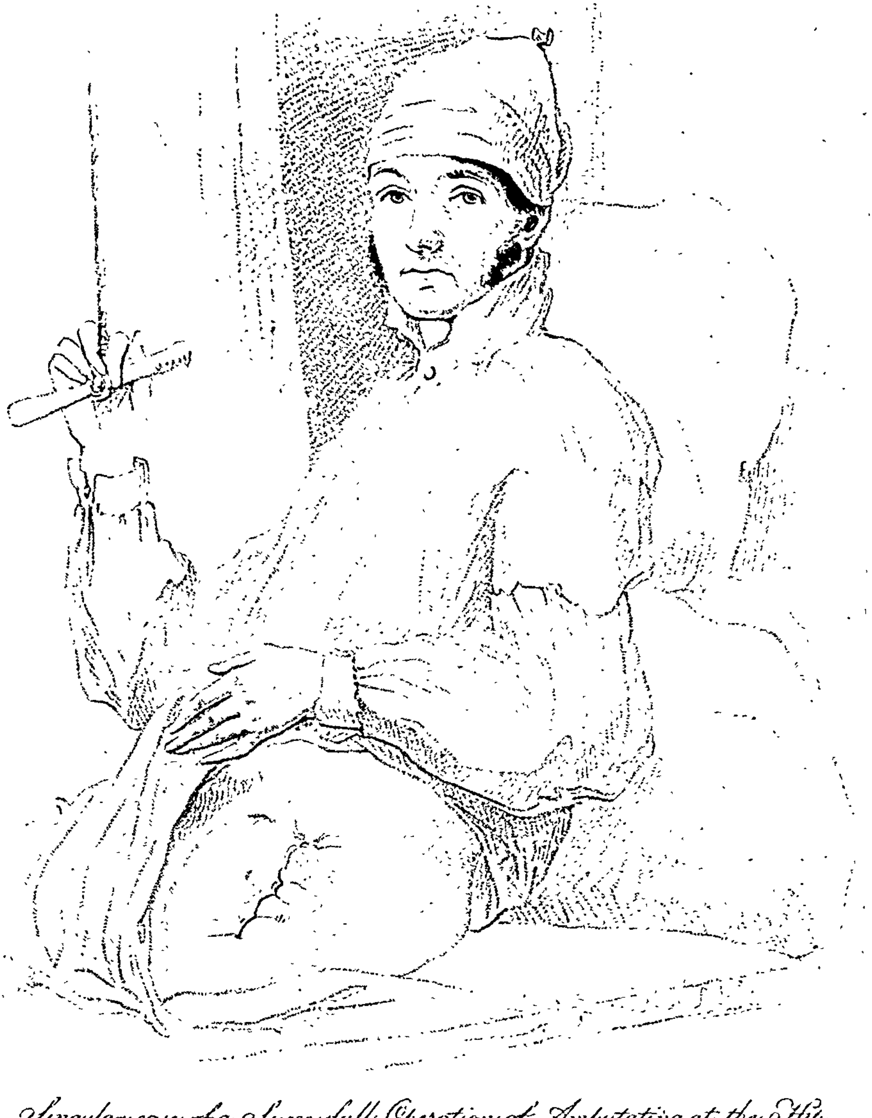
> little criticised by surgeons. . . . The amputation at the hip-joint, however, gentlemen, has been so often performed with success that it may now be considered as one of the established operations of surgery. Mr. Brownley, a military surgeon, first performed it during the last war: he did it without putting any ligature on the artery in the first instance; it was only compressed. Mr. Guthrie also performed this operation with success during the late war. He also performed the amputation through the trochanter major, without securing the artery in the first instance; I compressed the artery myself in that case. The amputation at the hip-joint has been performed in this way successfully by Mr. Larrey and many other surgeons; but notwithstanding the great respect I entertain for these authorities, I am disposed to think that the operation cannot safely be performed without securing the artery in the first instance.
>
> When you do not secure the artery in the first instance, what is likely to happen is this; when you have to divide the femoral artery as near to Poupart's ligament as possible, and put a ligature on it, the man becomes so faint under the operation, that he will be unable to support it. I have, in such a case, been obliged to suspend it, to give the patient wine, and chat with him in order to rouse the vigour both of his mind and body. The operation will certainly be most safely performed by tying, in the first instance, the femoral artery, under Poupart's ligament, above the origin of the profunda.

In Lee's edition of his lectures, the advice reads:

> I am ready to acknowledge that this is not the quickest mode of removing the limb; but securing the artery in the first instance prevents a patient, who is much reduced, from eventually sinking in consequence of the loss of a very considerable quantity of blood.

From his experiences in this operation he makes yet another recommendation, this time in regard to the level of separation of the femur.

> A question arises whether we should perform the operation of amputation at the hip-joint, when it can be done through the trochanter major. I say, No. Unless the disease of the thigh bone extends quite up to the joint as in the case in which I recently performed the operation, it is undoubtedly better to saw through the trochanter major than to cut the bone from the acetabulum. When the acetabulum is laid open, great constitutional irritation is produced by the suppurative process, abscess after abscess arises and the life of the patient is put into imminent danger.



Singular case of a Successfull Operation of Amputating at the Hip Joint performed January 17th 1824 on William Jones Aged 47 at Guys Hospital by Sir Astley Cooper Bart Surgeon to the King &c. &c. &c.

London Published [illegible] by [illegible] Bookseller to the London Hospitals.

PLATE 7

Lithograph of the patient who underwent amputation through the hip-joint.

[To face page 72

> Though this operation has been occasionally performed with success I feel it my duty to impress upon your minds most strongly the danger to which it exposes the patient; it occasions the most violent constitutional irritation, and reduces him to the lowest possible state, so that he can with difficulty recover, whereas the operation of amputation through the trochanter major is attended with very little risk.

Again in Lee's edition, he states:

> I am, however, of the opinion that in every case in which the amputation can be performed by sawing through the thigh bone below the attachment of the capsular ligament, that it should be done in preference to opening the joint and removing the head of the bone from its socket. I have only once amputated at the hip-joint, and the patient recovered, but only after excessive suppuration from the acetabulum, sloughing of portions of cartilage and continuance of suffering and fever exposing him to great risk, which would have been greatly lessened, had it been possible from the state of the bone to have sawn through the os femoris at the trochanter.

Here again he is strictly modern in his recommendation, and to-day disarticulation at the hip-joint is still looked upon as a procedure to be avoided unless the extent of the disease demands it. Section of the bone through or just below the trochanters is not only a much less severe procedure but also provides a stump much more favourable for the successful fitting of an artificial limb.

At the time of the operation he was severely criticised for disarticulating the bone at the hip-joint, but he answers this attack quite definitely by his above statement that in his case the disease extended "quite up to the joint" and that it was not possible, from the state of the bone, to have sawn through the femur below the capsular attachment.

It is unfortunately not possible to trace the specimen removed at this operation. It is not in the museum at Guy's or at St. Thomas's, nor at the Royal College of Surgeons, and no mention is made of it in any of the older museum catalogues to which access has been obtained.

CHAPTER XI

PUBLICATIONS

ASTLEY COOPER was not a prolific writer, neither did he hurry to publish his work, but his publications are impressive in their number and size and most of all in their quality. His first papers appeared in 1798, when the small volume of *Medical Records and Researches* was published containing two articles by him; his last book, the *Anatomy of the Breast*, was published in 1840, and so his publications extend over a period of forty-two years. Emphasis has already been given to the principle that he followed of neither teaching nor writing of things that he had not observed or verified himself by practice, by experiment or by dissection. He did not hesitate to refer to the work of others in support or extension of his statements or in acknowledgement of their achievements, but he refused to copy information of doubtful integrity from another book to one of his own. This high precept demanded much labour in dissection and in animal experiment, in addition to his vast clinical activities; no one familiar with his writings can doubt the immense labour behind them and it is not surprising, therefore, that he was rather slow to publish.

It is distressing to read the statement made by G. T. Bettany in the *Dictionary of National Biography* in his account of Sir Astley Cooper's life and work. Bettany writes:

> He cannot be classed among men of genius or even of truly scientific attainments; his works are not classic, but they are more than respectable. They are defective especially from their almost entire omission to refer to the works of others.

The standard of Bettany's appraisal can be judged by the fact that in a short article, which is supposed to review the work and contributions during a full half century by this very great and industrious surgeon, he can waste valuable space in recording personal characteristics and gestures of Sir Astley which might be calculated to provide amusement to contemporary medical students but hardly to dignify a work that was

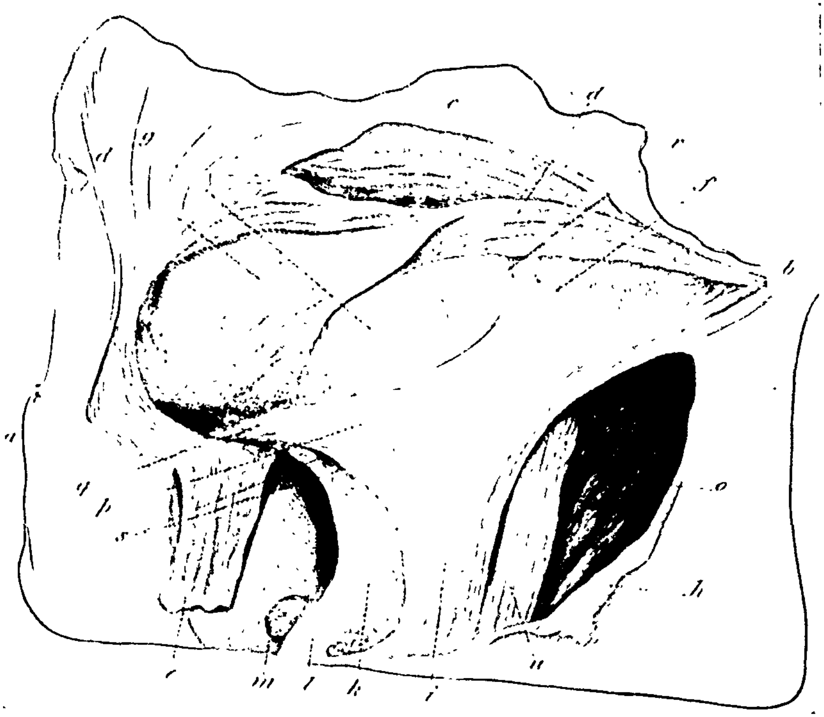
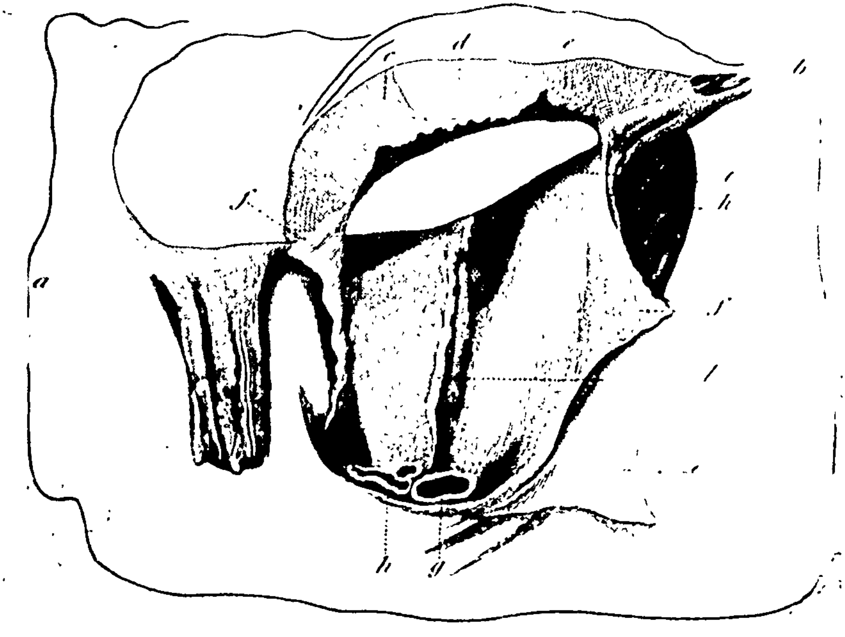


PLATE 8A
Astley Cooper's illustration showing transversalis fascia.



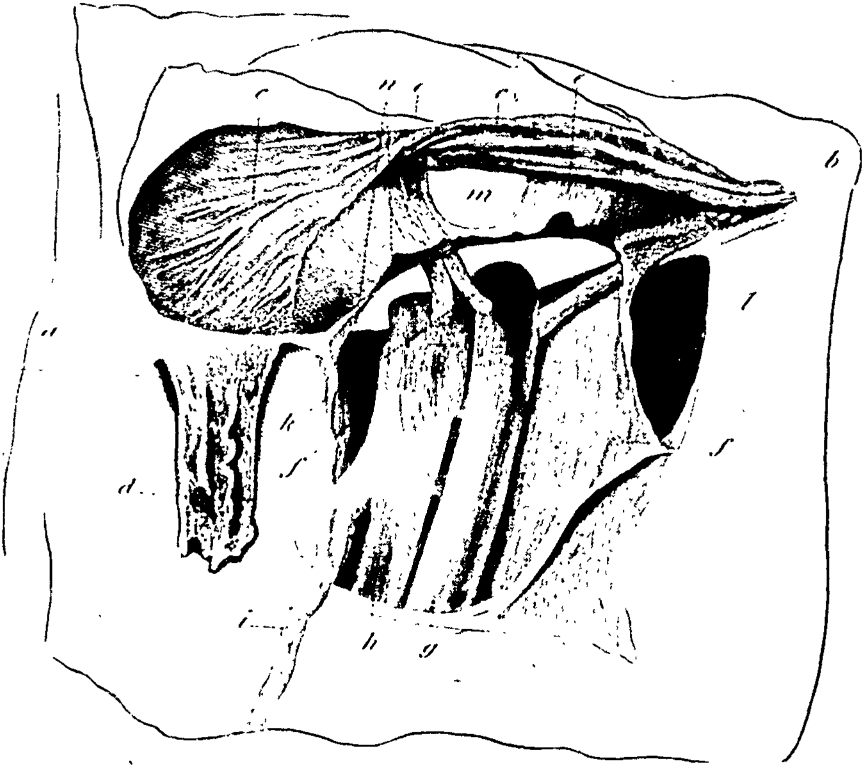


Plate 8c

Astley Cooper's illustration showing the formation and structure of the femoral sheath.

presumably meant to be read for information and serious enlightenment by posterity.

Astley Cooper's scientific attainments are not to be measured by precise laboratory standards, but it is astounding that anyone who pretends to have examined his work should accuse him of lacking science. His whole life-work was based on his desire to study disease and its treatment by scientific investigation and not by empiricism or by hypothesis. As shown in Chapter IX, all his contributions to arterial surgery were the result of patient and careful scientific work in the laboratory, post-mortem room and the wards.

When Bettany damns him with faint praise by saying that his works are "more than respectable" one begins to wonder whether Bettany consulted any reputable surgeon as to the position and esteem held by such works as Cooper's treatise on *Hernia*, on *Fractures and Dislocations* or on the *Breast*. The man would be courageous who suggested that his magnificent work on *Hernia* would sink into obscurity; it certainly remains a classic contribution.

His last book on the *Anatomy of the Breast* is not only a superb production but is also a mine of information, much of it original, which is as unchanging as the human frame from generation to generation. It can, with no fear of contradiction, be accepted as a classic work.

HERNIA

In Chapter IV a brief account was given of the publication of his first and greatest work, the treatise on *Hernia*. This brought him international fame as a surgeon. It should be part of the education of every surgeon to have studied this work. Those who have not done so have unwittingly absorbed from other sources much of the knowledge contained in it, for what Cooper wrote in 1804 is almost entirely unchanged in 1952, apart from the obvious advances due to the development of operative surgery and of asepsis. The basic daily rote of the surgery of hernia still remains as taught by him. Before his time the whole subject was confused, ill-understood and beset by quackery.

The work appeared in the full folio size and contained numerous and expensive illustrations, many of which were life-size, and all from dissections made by Cooper or his assistants. Even when all copies were sold he was £1000 out of pocket. Among those who helped him was

Colles of Dublin, who as a young man came to London and spent some months working with Astley Cooper for whom he developed a great admiration. This was in 1795 and shows that many years of preparation went to the completion of the work.

The first volume contained an account of the anatomy and surgery of inguinal hernia; the second volume, whose publication was delayed until 1807 owing to the large amount of original work involved, was devoted to femoral hernia, umbilical hernia, and to brief accounts of the rarer types such as obturator, sciatic, mesenteric and diaphragmatic hernia. In 1827 a second edition appeared in one volume and edited by Aston Key; this is considerably revised and some more illustrations are added, including some impressive colour prints of dissections of strangulated herniae.

It is difficult to make selections from such a work, but two parts seem to stand out above the rest. One consists of his original contributions to the anatomy of hernia; the other is his description of the management and treatment of strangulated hernia.

Contributions to the anatomy of hernia

Cooper's account of the anatomy of the hernial regions is painstaking and masterly; based on years of patient observation and dissection it is profusely illustrated by many superb figures. Unfortunately, in spite of the suggestion made by Sir William Lawrence (1838), his name is not connected with the most important of the structures first described by him. Lawrence, who was a surgeon to St. Bartholomew's Hospital, wrote a book on *Ruptures* which went through several editions, and in the fifth edition, writing of the *fascia transversalis*, he says:

> As the discovery of this fascia is entirely and exclusively due to the accurate anatomical investigations and patient research of a British surgeon, to whom we are indebted for the illustration of many other important points in anatomy and surgery, I have thought it right, after describing the parts as they have appeared in my own dissections, to subjoin Sir Astley Cooper's original description of a structure, which ought to be designated by the name of the discoverer.

According to Lawrence (1824, 4th edition), Astley Cooper was also the first to give a proper account of the internal abdominal ring. Richard Grainger (at first head of the well-known Grainger School and later Professor of Anatomy at St. Thomas's) also credits Sir Astley Cooper with the priority of description of these two structures. The account of the *fascia transversalis* (Astley Cooper's own name for it) as it appears in the second edition of his book is as follows:

> When the lower portions of the internal oblique and transversalis muscles are raised from their subjacent attachments a layer of fascia is found to be interposed between them and the peritoneum, through which the spermatic vessels emerge from the abdomen. This fascia, which I have ventured to name *fascia transversalis*, varies in density, being strong and unyielding towards the ilium, but weak and more cellular towards the pubes. Midway between the spine of the ilium and pubes, the opening will be seen, which is now generally known as the internal abdominal ring; the edges of it are indistinct on account of its cellular connexions with the cord; when these are separated, the fascia in which it is formed will be found to consist of two portions; the outer strong layer, connected with Poupart's ligament, winds in a semilunar form around the outer side of the cord, and bounds the aperture by a distinct margin, from which a thin process may be traced passing down upon the cord. The inner portion, which is found behind the cord, is attached to, but less strongly connected with the inner half of the crural arch, and may be readily separated from it by passing the handle of a knife between it and the arch. It ascends behind the tendon of the transversalis, with which it is intimately blended, passes around the inner side of the cord, and joins with the outer portion of the fascia above the cord, being at length firmly fixed in the pubes; the inner margin of the ring is less defined than the outer, the fascia transversalis being doubled inwards towards the peritoneum, to which it is firmly attached. Thus, then, it appears, that the *internal ring* is not a circumscribed aperture like the external abdominal ring, but is formed by the separation of two portions of fasciae, which have different attachments and distributions at the crural arch; the outer portion terminating in Poupart's ligament, while the inner portion will be found to descend behind it, to form the anterior part of the sheath that envelopes the femoral vessels. The strength of this fascia varies in different subjects; but in all cases of inguinal hernia it acquires considerable strength and thickness, especially at its inner edge; and if these parts had been formed without such a provision, the bowels would, in the erect posture, be always capable of passing under the edge of the transversalis muscle, and no person would be free from inguinal hernia.

In the 1827 edition he also adds the note:

> I discovered this in the following manner: Having frequently heard Mr. Cline describe the oblique course of the spermatic cord on the outer side of the epigastric artery, I wanted to examine into the cause of this obliquity, and to ascertain what parts closed the external abdominal ring. I found the tendon of the internal oblique attached to the pubes behind the ring, and, contrary to the description of Innes, the transversalis tendon also inserted into the pubes. Raising the internal oblique and transversalis muscles to examine the peritoneum, I was surprised to find a structure between them and the peritoneum, and an opening in it giving passage to the spermatic cord, which adhered to the edge of the aperture by a thin membrane.

Astley Cooper's right to the credit of this great contribution seems to have been forgotten; probably because the name he himself suggested for the structure—*fascia transversalis*—was so appropriate that it seemed illogical and retrograde to adopt Lawrence's suggestion that it be called Astley Cooper's fascia.

His contributions to the anatomy and surgery of hernia are, instead, commemorated by the attachment of his name to what he himself described as the "ligament of the pubis"; this is now known as "Astley Cooper's ligament" and is really the thickened ligamentous upper portion of the fascia covering the pectineus muscle as it arises from the ileo-pectineal line, where it forms the posterior relation of the neck of the femoral hernial sac as this passes into the thigh. The description and depiction of this ligament is most meagre in Cooper's book and he himself did not know of the practical surgical importance that it would acquire in the various plastic operations for closure of the orifice of the femoral canal. His own description is as follows:

> The pubis is covered by a ligamentous substance, which forms a particularly strong production above the *linea ileo-pectinea*, extending from the tuberosity of the pubis outwards and projecting beyond the bone above that line. Into this process the external oblique muscle is inserted.
>
> To see this clearly in dissection, the fascia covering the pectineus muscle, together with the muscle itself, must be cut away.

I have been unable to discover when his name was first attached to this structure and by whom.

Astley Cooper was also the first to give a clear account of the inguinal canal, of the correct mode of formation of the femoral sheath by the transversalis fascia in front and the iliac fascia behind, and of the covering given to the sac of a femoral hernia by the femoral sheath and which he called the *fascia propria*. His description of Camper's fascia is much fuller than Camper's original description, and it was he who suggested that Camper's name be attached to it.

This is a formidable list of anatomical contributions by one man to our knowledge of the structure of such an important region. It says much for Astley Cooper's powers of observation that these contributions were almost exclusively in connection with one of the most difficult and least understood aspects of practical anatomy—the fascial planes of the body; perhaps nowhere so important as in the surgical anatomy of inguinal and femoral hernia. His right to the credit for these discoveries seems to have been largely forgotten. At the time, however, it was freely accorded, for in addition to the acknowledgements already mentioned, we read in the preface to the second edition of his work:

> It has given me pleasure to find that these anatomists (Hesselbach, Lawrence, Scarpa), and many late anatomical writers, agree with my description of the *fascia transversalis*, the upper abdominal aperture (*i.e.* internal abdominal ring), and in the covering which the femoral hernia receives from the sheath of the femoral vessels and which I have named the *fascia propria*.

In writing of this last structure he says:

> the *fascia propria* is very liable to be mistaken for the sac itself; and another circumstance favouring this erroneous opinion is the fat that lies between the *fascia propria* and the true hernial sac; this is not unfrequently mistaken for omentum adhering to the subjacent structure, which is thought to be the intestine.

Strangulated hernia

His exposition of the surgery of strangulated hernia is convincing and interesting. It is particularly impressive that most of what he writes can be read with profit to-day, and with but a few minor alterations would provide a student with enough knowledge to pass any ordinary examination on the subject. When one reads his lectures it is easy to appreciate why he attracted such large crowds of students to hear his teaching. Simple, clear and direct, it presented the whole subject in a masterly fashion.

He introduces his account of the treatment of strangulated hernia by a pertinent remark.

> As all the symptoms which have been described originate from the compressed state of the protruded parts, it must be the surgeon's object to return them as soon as possible into the cavity of the abdomen, and he is only wasting time by any attempts to alleviate the violence of the symptoms independent of this principal object.

He then gives a careful description of the use of taxis to secure reduction, aided by the hot bath, opium, ice-pack, hot fomentation and tobacco enema. Only the last has gone completely out of favour to-day. He warns against the dangers of the ice causing gangrene of the hernia. Reduction *en masse* is described although not by name. His only gross error is the recommendation of bleeding to the point of syncope as an aid to taxis. In this he was led astray by the tyranny of tradition.

When these means have been tried without success he states that operation is needed. His arguments in favour of this show that he was far ahead of his time, and indeed they may still be used with advantage in connection with many common therapeutic problems of to-day.

> There is but little danger attending this operation, if the person upon whom it is to be performed be free from other disease. The cause of persons who have undergone this operation so frequently dying, is not to be attributed to the operation, but to the degree of mischief which has taken place previously to its being performed. When strangulation has existed for a long time, the contents of the hernia either become gangrenous, or in a state so nearly approaching it, that they do not recover their proper functions, otherwise inflammation extends from the strictured portion to the viscera within the cavity of the abdomen, and thus the surgeon has to combat with a severe disease after the removal of the strangulation. The danger is therefore in the delay, and not in the operation.
>
> Very frequently much time is unnecesssarily lost before an operation is proposed; and too much cannot be said in condemnation of this practice. A patient is submitted again and again to taxis, and the swelling is rendered extremely tender, by being so often compressed, in the hope of avoiding operation, until at length the rapid increase and urgency of

> the symptoms point out the impropriety of such delay; and an operation is performed when but little prospect of success remains.

Sir Charles Symonds, in commenting on these words, says that in spite of them, fifty years and more after they were written, the operation was considered so dangerous that medical men delayed sending up the cases, the patients refused operation, and the senior surgeons of 1870 to 1880 often acquiesced in a delay which proved fatal. Even in 1882, when Symonds was first called to operate for strangulated hernia, and convinced of the safety of antiseptic methods, he was one of ten who failed to persuade a patient to submit to operation; in private practice the struggle was sometimes equally great.

It is interesting for a modern surgeon to read the account of what was done at the operation for relief of the strangulation in those days of pre-anaesthetic and pre-Listerian surgery. No student or young surgeon can fail to profit by carefully reading Astley Cooper's remarks on the anatomy of the formation of the constriction and his instructions as to the method of its division. After recommending that the sac be opened at the lowest and anterior part, as the intestine is there in the least danger, he says:

> The surgeon should now pass his finger into the hernial sac, and examine accurately the seat of the stricture, which he will find in one of the three following situations:
>
> First—At the internal abdominal ring, in the mouth of the sac.
>
> Second—In the inguinal canal, an inch, or an inch and a half within the external ring.
>
> Third—At the external ring.
>
> The most frequent seat of stricture is at the internal abdominal ring, from one inch and a half to two inches above, and outwards from the external ring, and it is occasioned by the pressure of the internal oblique and transversalis muscles upon the mouth of the hernial sac, which becomes thickened, more especially on its pubic side.

After describing the exposure of the hernial sac as far as the seat of stricture he explains the method of dividing the stricture by means of a bistoury, and directs that the gentle sawing motion of the knife should be made upwards in a direction parallel with the *linea alba*. Later, in discussing the relief of strangulated direct inguinal hernia, he advises that the cut should also be made directly upwards. As he correctly points out, if the surgeon is *certain* he is dealing with a direct hernia it is safer to cut upwards and inwards to avoid the deep epigastric artery,

> but if, in some instances, the operator is directed to make the incision in one way, and in others precisely the reverse, there will always be reason to fear some mistakes in practice, which would be attended with the most serious consequences. It is therefore desirable to point out such a mode of operating as would ensure the safety of the patient, of whatever kind the hernia may be. Such are the advantages possessed by the method of making the division directly upwards, opposite to the middle of the hernial sac, for in this direction the epigastric artery is certainly avoided.

This instruction remains unchanged and is in accordance with the best surgical practice of to-day.

He describes a method he has used of dividing the stricture without including the sac.

> The tendon of the external oblique having been divided a little above the external ring, the sac is gently drawn down, while the muscles are drawn up by an assistant. In this way the stricture is brought into view, and can be divided without risk, and without including the peritoneum.

He was led to do this because of the danger of wounding the intestine if, when the stricture is not in view, the knife is passed blindly upon the finger as a guide.

> An advantage is derived from dilating the stricture without cutting the sac itself, for there is no danger of injuring the intestine with the naked edge of the knife, which I have twice known to happen when the stricture was divided from within the sac.

There are considerable differences in his teaching in regard to the treatment of gangrenous or damaged intestine between the first edition of 1804, and his later clinical lectures and the second edition of 1827.

In the 1804 edition, in discussing the treatment of a small opening in the bowel, he advises that a stitch be passed through the gut and through the neck of the sac to hold the intestine there so that the contents

> pass readily from the opening by the wound, but will in part take their course by the rectum. As granulations arise and the wound becomes closed the intestine is gradually shut.

In other words he recommends enterostomy.

In the later edition he directs that if the gut should be wounded the edges of the hole should be picked up with forceps, a fine silk ligature tied round, and the gut replaced near the neck of the sac. He no longer recommends passing a stitch through the mesentery and the neck of the sac as he has found it unnecessary; the intestine retains its position and quickly adhered by itself.

His advice on the treatment of gangrene of a whole segment of intestine changes over the years due to greater experience, but it is remarkable that his earliest recommendations would find greater favour to-day than his later ones. Unfortunately he had felt the limitations of pre-aseptic surgery and of imperfect methods of intestinal suture in the years between. Briefly, in 1804 he discusses and recommends resection of the bowel and anastomosis; in his later teachings he advises an enterostomy only.

In the first edition he writes:

> When the whole cylinder of the intestines is mortified it is necessary to proceed very differently. Then the mortified part should be cut away and the ends are to be brought in contact and confined by means of four ligatures. As far as judgment can be formed from experiments made upon animals, it will be seen that this operation is then made both safe and efficient, for I have made the experiment of dividing the intestine and afterwards sewing its extremities together, and was pleased to find it succeed.

He now describes experiments to support this.

Experiment I

The intestine in a dog was exposed and divided and was then joined by three sutures over a cylinder of isinglass; one at the mesenteric attachment and the other two on each side. In three days the animal had normal stools; on the sixteenth day it was killed and the united portion of intestine was shown to the students at lecture.

Experiment II

He decided that the isinglass gave no advantage, and in another dog sewed the divided intestine with three sutures without including the isinglass. On the second day the dog took food, on the third appeared playful, on the fifth the ligatures came away, after which he suffered nothing from the experiment.

In both these experiments the gut was returned into the abdomen where it rested against the wound in the parietes and the stitches were left hanging outside. In contrast with this method he tells of some experiments by a Mr. Thomson who was a lecturer in surgery at Edinburgh and a friend of his, in which the divided gut was united by interrupted sutures all round the bowel and then by four other stitches placed at equal distances. These stitches were all cut short and the bowel was then returned to the abdomen which was closed. The dog was killed on the 10th day and a perfect, almost invisible, junction was found and some of the stitches had ulcerated into the lumen and had been passed. Thomson repeated this experiment using only five stitches, and when the dog was killed six weeks later the junction was almost invisible; on opening the bowel two stitches alone remained.

Astley Cooper concluded:

> It appears, then, by these experiments, that in animals which were the subject of them, not only the intestine may be returned into the cavity of the abdomen, but the ligatures which are applied to it; and that no apprehension need be entertained of these ligatures being separated into the cavity to produce the inflammatory effects of extraneous bodies.

However, as he felt that the inflamed condition of the strangulated intestine might not allow such a safe separation of the stitches, and as it appeared from the first experiments that no harm came from leaving the stitches long and hanging from the wound, he stated that he would still prefer to do this so that the stitches could be taken out if necessary.

> The practice which, therefore, ought to be followed in an intestine divided by mortification, is to cut off its mortified extremities, and then to pass four stitches through them, one at the mesentery, and the three others at equal distances around the intestine.

The junction was then to be secured by a stitch through the neck of the hernial sac. If all went well the stitches were to be left to cut out of their own accord, but

> if there are no stools, and the patient suffers from a distended abdomen, three of the stitches should be cut away, leaving that which attaches the intestine to the hernial sac, as well as that which joins its edges at the mesentery. The faeces can then readily escape at the external wound, and as the wound heals the mouths of the divided intestine will become united.

He then quotes a case in which resection and suture was done in this way, and on the first day, owing to abdominal distension and failure of a bowel action, three of the stitches were removed. The patient recovered with a small and manageable fistula.

In 1827, as a result of further experience, he advises against resecting gangrenous gut and recommends that

> the stricture should be divided in the manner I have described, after which a free incision should be made into the gangrenous intestine, to allow of the escape of its contents, and then it should be returned to the upper part of the sac, the wound should be left open, and a poultice applied; but if the portion of intestine which has descended be not large, it should not be disturbed from its adhesions to the sac.

Again this advice is sound to-day in spite of the advances in intestinal surgery. It is true that in certain cases with gangrenous gut resection with anastomosis or some lesser procedure such as lateral anastomosis above the gangrenous portion may be done with success, but many surgeons of great experience still teach that the safest thing to do in all such cases is merely to open and drain the affected loop.

Cooper then describes a case on which he was called to operate at St. Thomas's Hospital in the absence of Mr. Chandler, in 1808; showing that he saw patients and operated on them although he was not surgeon to St. Thomas's. The patient was a woman with a strangulated hernia containing gangrenous gut. He divided the stricture, incised the bowel and allowed it to drain externally. The patient made a complete recovery and the fistula and wound closed spontaneously. Five months after the operation she gave birth to a child.

In discussing the formation of faecal fistula after sloughing of strangulated intestine, he gives an accurate account of the "gun-barrel" arrangement of afferent and efferent loops and then describes a method of dividing the intervening spur which he learnt from Dupuytren when he visited him in Paris. Dupuytren's enterotome is illustrated and is identical with a common pattern in use to-day. Few surgeons know of the use of this method over a century ago and that it had been used before the time of Paul and Miculicz. Paul, in his original paper (1895) and in a later paper (1912), mentions that he selected Dupuytren's instrument to crush the colon's spur. Although complete cure did not usually follow destruction of the spur by the enterotome, Astley Cooper points out that the patient at any rate gains by the exchange of an artificial anus for a faecal fistula.

As the sac was not excised it was customary afterwards to fit the patient with a truss. Astley Cooper recognised the problem of recurrence through leaving the sac, and describes a case in which he found the sac but little attached to the surrounding parts and so removed it and closed the neck with sutures. (In the copy in the Wills Library the original owner has made a marginal note: "I think an unwarrantable experiment.") A month after operation the patient had a hernia nearly as large as before. From this he concludes that the removal of the sac will not prevent recurrence,

> nor do I think, upon reflection, that it scarcely could be expected to do so, as the aperture from the abdomen remains equally large, and the peritoneum alone offers resistance to the formation of another hernia, and this had been insufficient to prevent the protrusion of the first.

The removal of the sac, he says, usually involves a very tedious and hazardous dissection up to the level of the internal abdominal ring and is therefore objectionable. Finally, he says the great danger of ligation and excision of the sac is inflammation leading to peritonitis.

Here again we have a clear and reasoned consideration of an important surgical step in the operation. We cannot doubt that the freeing of the sac in a conscious patient up to the internal abdominal ring would be objectionable and the risk of sepsis, to us, is obvious. His experience of recurrence following excision of the sac and his rejection of it on this account must be judged by remembering that wounds then usually healed by secondary intention, and even to-day the most potent cause of recurrence of hernia is wound sepsis. Also, operation was not done for early non-strangulated hernia, but only for strangulated ones, most of which were of long standing. We recognise to-day that these need a plastic repair as well as excision of the sac. Astley Cooper implies this need for reinforcement when he says that the unsupported peritoneum could not be expected to prevent recurrence of the hernia.

Very large herniae were common and he points out that a different mode of operating is needed because it is often quite impossible to push the contents back into the abdomen, and even if they should be pushed back without laceration they will not stop there. Moreover, complicated adhesions may be present.

> Instead of performing the same operation, as in other cases, I should, in these circumstances, merely expose the upper part of the hernial sac,

> and divide the stricture without opening the peritoneum, unless the stricture happened to be seated in the mouth of the sac itself.

He describes a case in which he did this successfully in a man who had a strangulated hernia so large that it reached half-way down to his knees.

> Should the stricture be seated in the neck of the hernial sac itself, of course, the division of the parts exterior to it will not relieve the strangulation; in this case the sac must be opened carefully *at its upper part only*, so as to allow of a division of the stricture.

With regard to femoral hernia he states that the constriction may be at one or two places.

> If the hernia be large the seat of the stricture may be at or under the opening in the fascia lata, through which the covering formed by the sheath of the femoral vessels is protruded; but generally, the stricture will be found immediately beneath Poupart's ligament, in the mouth of the sac itself, where the hernia quits the abdomen. In some cases, when the hernia is large, strictures may be found at the crescentic margin of the fascia lata, and under the crural arch of Poupart's ligament, and such will require division.
>
> In dividing the inner stricture it has been recommended to cut in the direction of Gimbernat's ligament, inwards towards the pubis; but as the stricture is not occasioned by the ligament there cannot be any necessity for dividing it; I have known Gimbernat's ligament divided, from an idea that it formed the stricture, but the stricture still remained at the orifice of the fascia, or in the mouth of the sac itself, and the patient died.

CHAPTER XII

PUBLICATIONS (CONTINUED)

FROM 1807 until 1818 Astley Cooper's publications were confined to papers in the *Transactions of the Medico-Chirurgical Society*; *Surgical Essays*, in collaboration with Benjamin Travers, then appeared, followed by a second volume in 1820. Much of the first volume of essays was devoted to fractures and dislocations, and it was this part of the book that impressed Astley Cooper with the disadvantages of presenting such a subject in an incomplete state among an assortment of other papers. It was also a subject particularly suitable for a monograph, and he determined not to publish any more instalments of *Surgical Essays* but began to prepare material for a complete monograph on *Fractures and Dislocations*. This treatise appeared in 1822, just fifteen years after his first monograph, that on *Hernia*, was completed.

FRACTURES AND DISLOCATIONS

Although this work does not possess such an original character as the treatise on *Hernia*, it is a most impressive and important contribution and is probably the most practical of his books and had the widest appeal. Before his time there had been but little advance in the knowledge of fractures and dislocations since Hippocrates, but the appearance of this book presented clearly and convincingly a great amount of new knowledge. Dislocation of the hip-joint, for instance, was thought by many not to occur; and those who admitted its occurrence doubted the possibility of reducing it. Cases were often seen in hospitals where a dislocation had been treated as a fracture until it was too late to reduce it, or conversely severe damage was inflicted by manipulation of a fractured limb in the belief that it was dislocated (Maccormac). The result of Astley Cooper's clear and concise teaching was to dispel a cloud of ignorance and error, and his book enabled his doctrines to spread all over the country.

Like all his other monographs, except *Hernia*, it was in quarto form. It is beautifully produced and contains, as usual, many superb illustrations which depict with great clarity and simplicity what they are intended to convey. Worthy of special mention are the diagrams illustrating features of diagnostic importance, such as the posture in the various dislocations of the hip-joint. Almost all the common fractures and dislocations are shown dissected and displayed, and much original research work is also illustrated. Like the volumes on *Hernia* the expenses of production were not covered by the price, which he insisted should be kept as low as possible; he was, therefore, out of pocket himself. It was a great success and quickly went through six editions; in 1824 it was translated into several languages.

By a happy gesture it was dedicated to the "Pupils of Guy's and St. Thomas's Hospitals"; as with all his books, the dedication was interesting and original.

> MY DEAR YOUNG FRIENDS,
>
> This work was composed for your use, and if you derive advantage from it, my principal object is fulfilled; but I shall take this opportunity to express my gratitude to you for the affectionate and respectful manner in which you always receive me as your instructor. Your parents and relatives, many of whom were my pupils, are also entitled to my most grateful acknowledgements; they fostered me in early life, and, by their friendship and recommendation, have largely contributed to procure me a degree of success, I fear, beyond my merits, and a course of uninterrupted happiness which few have been permitted to enjoy.
>
> Believe me always,
> Your affectionate friend,
> ASTLEY COOPER.

The *Medico-Chirurgical Review* said of it:

> such a mass of important practical matter was never, we believe, before laid open to the public; and Sir Astley Cooper's work, when the author has mouldered in the dust, will continue to exercise that influence on the surgical profession at large, which he has so long exercised within the sphere of his personal acquaintance and practice.

It is difficult to select portions for special mention from such a work as this, but three things appear to demand it.

Avoidance of amputation for compound fractures

Immediate amputation was commonly recommended for compound fractures, but Astley Cooper was many years ahead of his time in recognising and advising that this might often be avoided.

He writes that if loose fragments of bone can be felt, the wound should be enlarged for their removal and instead of fomentations and poultices, a piece of lint, dipped in the patient's own blood, be applied to the wound and bound in place. The whole limb should then be immobilised on a splint and

> *should not be disturbed*, unless the patient has symptoms of a suppurative process, when a small opening should be made in the bandage to allow of the escape of the pus, *but still the bandages should be suffered to remain.*

The italics are mine and serve to emphasise how his treatment was in accordance with the best and most up-to-date principles of wound treatment up to the time of introduction of antibiotics. Many a limb must have been saved by this treatment.

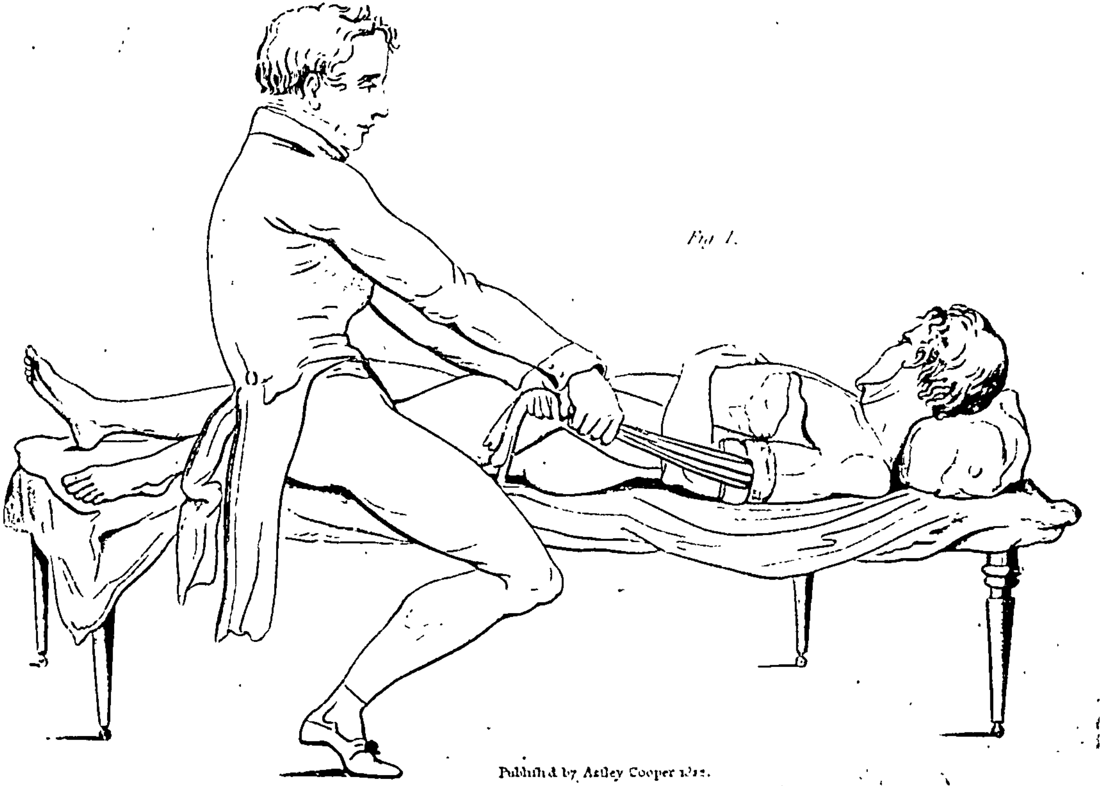
Astley Cooper's method of reduction of dislocated shoulder

It is possible that Sir Astley Cooper was not the first to use the "heel-in-the-axilla" method for reduction of a dislocated shoulder, but his description and illustration of it appear to be the first. Helferich, in his *Treatise on Fractures and Dislocations*, describes four methods of reduction of a dislocated shoulder, two of which he names after Astley Cooper. These are the heel-in-the-axilla, and the method of traction with the arm in the strongly abducted position while direct pressure is made on the head of the humerus. Astley Cooper definitely states that he learnt the second method from Henry Cline, although he modified and improved it, but of the first he says "and that I usually adopt in my private practice in all recent cases". It would be peculiarly appropriate if Astley Cooper's name were permanently attached to the "heel-in-the-axilla" method, if for no other reason, in recognition of his great contributions to the surgery of fractures and dislocations.

He describes the method as follows:

> The patient should be placed in the recumbent posture, upon a table or a sofa, near to the edge of which he is brought; the surgeon then binds a wetted roller round the arm immediately above the elbow, upon which he ties a handkerchief; then, with one foot resting upon the floor, he separates the patient's elbow from his side, and places the heel of his other foot in the axilla, receiving the head of the os humeris upon it,

Fig. 1.



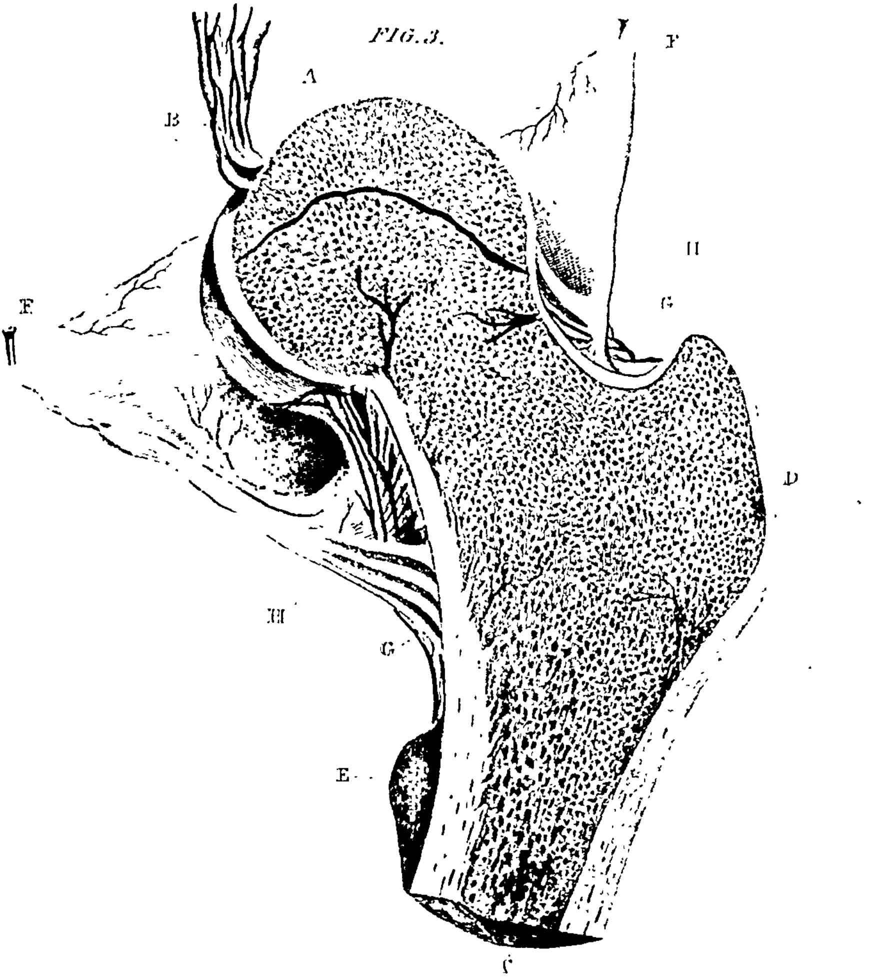
Published by Astley Cooper 1822.

PLATE 9

Astley Cooper's method of reduction of a dislocated shoulder.

[To face page 88

FIG. 3.



Drawn & Engraved by C J. Canton

PLATE 10
Injected specimen to show the blood-supply to the head and neck of the femur.

> whilst he is himself in the half sitting posture by the patient's side. He then draws the arm, by means of the handkerchief, steadily for three or four minutes, when in common circumstances, the head of the bone is thus easily replaced; but if more force be required, a long towel may be applied instead of the handkerchief, by which several persons may pull, the heel still remaining in the axilla. I generally bend the forearm nearly at right-angles with the os humeris, because it relaxes the biceps, and consequently diminishes its resistance. I have, in many cases, extended from the wrist, by tying the handkerchief just above the hand, but more force is required than in the former mode, although it has this advantage, that the bandage is less liable to slip. In recent cases it very rarely happens that this mode of extension fails, and it is so easily applied in every situation, that I have recommended all our young men to employ it in the first instance, when called to this accident.

In using the method to-day the bandages are usually dispensed with and the pull taken by grasping the forearm at the wrist. It should be noted that the picture shows the shoe has been removed from the foot used in the axilla, although Cooper does not mention it in the text!

Intracapsular fracture of the neck of the femur

The non-union that follows this common and disabling fracture was the circumstance that prompted Astley Cooper's striking words:

> Young medical men find it so much easier a task to speculate than to observe, that they are apt to be pleased with some sweeping conjecture, which saves them the trouble of observing the processes of nature.

It arose from his story of a doctor who had given a good prognosis in such a case and when taxed on it by Astley Cooper replied

> that he was not aware but that the fracture of the neck of the thigh-bone would unite like those of other bones of the body.

Sir Astley Cooper carried out many investigations and experiments to determine the factors responsible for this non-union, and the conclusions he came to have not been improved upon until the introduction of the Smith-Petersen nail some twenty years ago emphasised the major importance of absolute immobility of the fragments upon one another combined with accurate apposition. The importance of the factors pointed out by Sir Astley Cooper, notably the displacement and the poor blood supply of the proximal fragment, remains unchallenged.

The first circumstance he put forward as responsible for the non-union was faulty apposition of the fragments due to their separation by muscular pull, and he supported this both by observation and dissection in man and by many experiments in animals. He showed, for instance, that resection of a segment of radius or ulnar, thus creating a gap, was followed by non-union, and he illustrates a specimen of fibrous union of the os calcis in a rabbit after the part bearing the insertion of the tendo Achilles had been separated by experiment. Most of the details of his animal work have been repeated by research workers into the causes of non-union during this century and reported by them probably without realising that Astley Cooper had done the same over a century before.

His most interesting contribution, however, is in regard to the part played by the imperfect blood-supply to the proximal fragment. He writes:

> But the third and principal reason which may be assigned for the want of union of this fracture, is the almost entire absence of ossific action in the head of the thigh-bone when separated from its cervix; its life being supported by the ligamentum teres, which has only a few minute vessels, ramifying from it to the head of the bone. The structure of the arch of the thigh-bone, and the parts surrounding it, is explained in the account of the anatomical plate connected with this part of my subject. But here it may be observed, that the neck and head of the thigh-bone are naturally supplied with blood by the periosteum of the cervix, and that when the bone is fractured, if the periosteum be torn through, to which there are very rare exceptions, the means of ossific action are, in consequence of such fracture and laceration, necessarily destroyed in the head of the bone. Scarcely any change therefore takes place in the head or neck of the bone attached to it; no deposit of cartilage or bone, similar to that of the other fractured bones, is produced.

The importance of interruption of the blood-supply to the proximal fragment is illustrated by his plate showing the normal distribution of blood-vessels to the head and neck of the femur, including a display of the retinacula. In the description of this plate he remarks that "if union of the neck of the thigh-bone be ever met with, it will be in a case in which the ligamentous sheath of the cervix is not torn". The illustration of this beautifully injected and instructive specimen is unfortunately too little known (Plate 10). It is one that might well find a place in any modern text-book on fractures. It is an illustration which typifies the careful, original and painstaking work of Sir Astley Cooper in his presentation of specimens designed to throw light on obscure anatomical or pathological problems.

TREATISE ON DISEASES OF THE BREAST

Sir Astley Cooper resigned from the staff of Guy's Hospital in 1825 and retired temporarily from practice in 1827. The greater freedom of time which he now enjoyed was used in writing further monographs, and in 1829 he published a *Treatise on Diseases of the Breast*, dedicated to Mr. Harrison, Treasurer of Guy's Hospital. This volume was devoted to non-malignant diseases of the breast and as usual contained many beautiful illustrations, not a few of which were in colour. In the next year, 1830, his next book appeared—on the Testis.

THE TESTIS

This monograph also ranks amongst his best works and in length is next to *Fractures and Dislocations*. It is a comprehensive study of the normal anatomy of the testis, followed by a description of the pathology and treatment of its diseases. The care, patience and skill expended on the anatomical dissections can be appreciated by one glance at the illustrations; the unravelling of the epididymis with the display of the efferent ducts and the demonstration of the lymphatic connections with the para-aortic glands is most impressive. No one who wishes to study the details of the anatomy of the testis can afford to overlook Sir Astley Cooper's dissertation. For the difficult dissection of the epididymis and the testis he used a new and original method of injecting with coloured glue. This not only produced beautiful preparations but made the dissection of the tubules easier and less liable to be injured than when mercury was used. He tied the spermatic vessels on one side and the vas deferens on the other in a dog, and showed that whereas sloughing occurred on the side of the vessel ligation, the obstruction of the vas was not followed by atrophy of the organ. Many are still ignorant of the effects of ligation of the vas, even though Astley Cooper demonstrated it some 120 years ago.

A clear and well-illustrated account is given of malignant disease, although the ignorance of the true pathology of this condition at that time led to certain types masquerading under peculiar names. Syphilis of the testis was thought to be a rare disease, but he was able to show that it was by no means uncommon and responded to treatment with mercury. In the same way he gives an accurate account of tuberculous disease of the organ and shows that it also is not rare, as was generally supposed.

Perhaps the most interesting section is that on hydrocele. On page 172 we learn that: "The largest hydrocele I ever heard of was in Mr. Gibbon, the historian, from whom Mr. Cline drew off six quarts of fluid." The account of the treatment of hydrocele is especially interesting; after describing the different methods used a few years earlier he writes enthusiastically about injection, and says that the profession and mankind are indebted to Sir James Earle for its suggestion. The fluid used was equal parts of port wine and water; also "One dram of the sulphate of zinc to one pint of water makes an excellent injection." Details of the technique of the injection treatment are given. In his surgical lectures he makes the amusing observations:

> If you use port wine, the proportion of wine and water should be half and half. If it be old port wine, you may mix four parts of wine with three of water; but if the wine be such as is commonly got at taverns and public-houses, in which there is a good deal of log-wood or sloe-juice to make it astringent, and a good deal of brandy to make it strong, a less proportion of wine must be used, as the injection would otherwise be too stimulating to the tunica vaginalis. Brandy, or spirits of wine, may also be employed; in the latter case take one part of spirits of wine to fifteen parts of water. The injection which we generally use in the hospitals is the sulphate of zinc, in the proportion of one drachm to a pint of water. A gentleman, on being told that we employed the sulphate of zinc in hospitals, for injection in hydrocele, exclaimed: "Oh, I suppose you do this to save your wine." It is not to save our wine, however, gentlemen, that we prefer this solution, but because we are better enabled to judge precisely of the strength of the stimulus by the use of the sulphate of zinc than by that of wine, which is subject to so much adulteration.

Setons, he writes, are very rarely used, but they may now and then be used advantageously. In young patients he preferred a seton to injection.

THE ANATOMY OF THE THYMUS GLAND

In 1832 appeared *The Anatomy of the Thymus Gland*, a most unexpected contribution from a surgeon. It is difficult to reconcile the publication of this book with the accusations of those critics who referred to him as a worldly gold-loving surgeon of no scientific attainments. He was then sixty-four years of age and after a life of hard work in a busy hospital and private surgical practice could have rested from his labours with justification. Only a true love of research and of the acquisition of knowledge for its own sake could have prompted him, in his declining years, to undertake this piece of work in pure science. This display of the normal and comparative anatomy of the thymus gland is complete and valuable; once more the splendid illustrations speak of the skilled and painstaking injection and dissection of the specimens. As in his other monographs, he states that all the specimens from which the illustrations and descriptions arose are preserved in his museum and are available for inspection by any doctor, English or foreign, who may wish to study them or to verify his findings.

He points out that the value of comparative anatomy is well shown in the case of the thymus, for except in one instance he was unable to display the lymphatic vessels in the human thymus whereas in the calf the lymph vessels, lymph glands and lymph trunks can be readily demonstrated. The lamb and the calf are more readily investigated than any of the many other animals he used.

In the foetal calf he was able to demonstrate two large lymphatic trunks which run down the posterior surface to open directly into the innominate veins; these are so big that he was able to inject them with coloured wax (see Plate 11). Although tempted to call them excretory ducts he recognised that they are large lymphatic vessels and decided to call them "*absorbent ducts* of the gland, and they are the carriers of the fluid from the thymus into the veins of the lower part of the neck". He had already noted the abundant fluid secretion which exuded from the foetal thymus when incised.

His observations on this outpouring of the thymic secretion, not through a duct, but via the lymphatics direct into the blood-stream as an internal secretion, is again far ahead of his time.

He made no less important observations on the thyroid gland, which are unfortunately too little known as he did not publish them in a monograph. He described the alveolar spaces (or "cells") of the thyroid, and the fluid contained in them, and demonstrated large lymph channels, some of which he again traced to the thoracic duct or direct to the large veins. Maccormac (1894) says:

> In the Museum at Guy's there was a preparation which he had made of the lymphatic channels in the neck of a horse, showing several of these vessels emerging from the thyroid gland and, after uniting together, entering a vein. In his lectures at St. Thomas's 1788–89 he demonstrated these facts and announced the conclusion, a striking one in the light of our modern investigations, that the lymphatic channels represent the absent duct. Thus, quite a century ago, he enunciated the view favoured by modern physiologists that the lymphatics discharge the function of a duct for the thyroid gland, and that the colloid material in the alveoli is a secretion.
>
> In the course of his researches he examined the thyroid of cats, dogs, sheep, oxen, pigs and horses, and excised the organ in many dogs, both full-grown and puppies, noting carefully the results which followed, especially the enlargement of the cervical lymphatic glands, a fact which quite recent observations have confirmed. There is no doubt that had his experiments been carried a little further he might have anticipated Kocher's discovery of *cachexia strumipriva*.

Nearly fifty more years have passed since Maccormac wrote these words, and yet they remain true comment. Astley Cooper's observations on the thyroid are striking, but even more remarkable are his observations suggesting a connection between the thyroid and the thymus.

Williamson (1925), in his fascinating Arris and Gale Lecture, postulates that the thymus gland is a reservoir for the thyroid products and describes the lymphatic and vascular connections between the two glands. He illustrates a foetal specimen of Astley Cooper's from the museum of the Royal College of Surgeons, showing the stalk of the thymus which Astley Cooper demonstrated to be absorbent vessels connected with the thyroid lobes. He also quotes Astley Cooper's remark, in speaking of the cervical part of the thymus: "I have generally seen it joined by vessels to the thyroid gland." Williamson concludes by saying: "We are thus presenting a confirmation of work published as long ago as 1832 by a distinguished Fellow of this College."

The lymphatic connections between the two glands is perhaps best

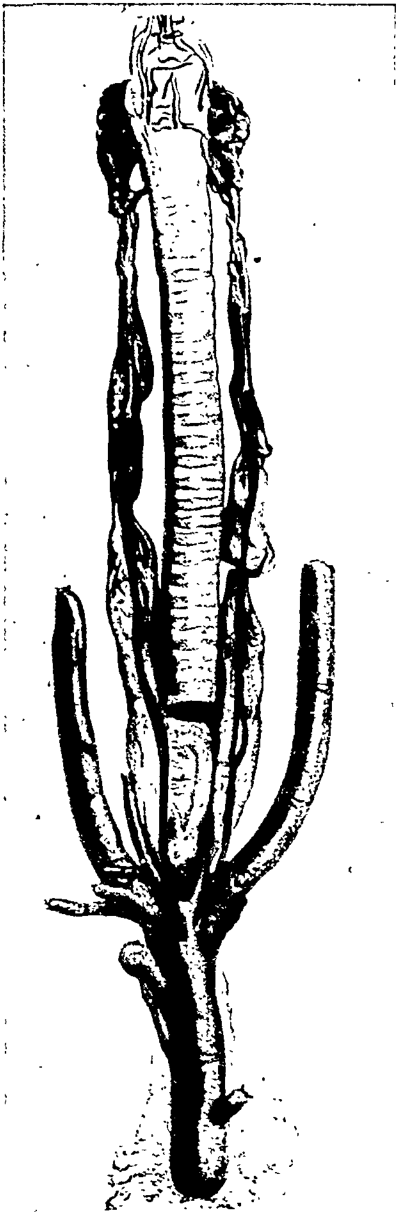


PLATE 11

Specimen of the thymus from a foetal calf to display the two large lymph vessels draining directly into the innominate veins.

[To face page 94

shown by the spread of secondary deposits of carcinoma of the thyroid to the substance of the thymus. Even to-day we are largely ignorant of this subject, and it is all the more remarkable that Astley Cooper should have made such startling discoveries on this most abstruse subject over a century ago.

GUY'S HOSPITAL REPORTS

In 1836 the first volume of the *Guy's Hospital Reports* was published and contained three important papers by Sir Astley Cooper which have been dealt with in the chapter on his contributions to arterial surgery. He published several papers in later numbers, making eleven in all, and he also directed that after his death examination should be made of his body and the findings published in the *Reports*. This was duly done in accordance with his will.

THE ANATOMY OF THE BREAST

Sir Astley Cooper had intended to follow the *Treatise on Diseases of the Breast*, published in 1829, by a second volume on malignant diseases of that organ. He had been collecting material for this work for many years but delayed publishing it while he was writing his books on the testis and the thymus. When he came to put this material together he decided that it was necessary to give a full and proper account of the normal anatomy of the breast as the descriptions then existing were meagre, incomplete and often inaccurate. This book appeared in 1840 and was the last one he published. He was then seventy-two years of age, he had an assured position as the acknowledged leader of surgery in the country; honours and decorations, both English and foreign, had been conferred upon him; his industry and success had brought wealth. It would have been understandable if he had decided to spend his days in ease and in the enjoyment of the fruits of his long labours. Certainly if he had been the sharp, worldly-minded surgeon some have suggested him to be, he would not have applied himself so diligently to produce this polished classic. No one but a true scientific surgeon could have settled down to this exacting and painstaking task at an age when most men have lost all ambition. His essential love of good surgery and of the fundamental knowledge on which it must be based is amply shown.

The description of the normal anatomy of the female and male human breast is complete, and but little of importance has been added to it since. The incomplete and unsatisfactory descriptions then existing have been mentioned; his complete presentation of the subject naturally involved original descriptions and his contribution to our knowledge of the normal anatomy of the breast has been immortalised by the attachment of his name to the suspensory fascial ligaments which he was the first to describe. A contemporary review in the *British and Foreign Medical Review* says that "Sir Astley Cooper will always be the standard authority on the subject and the work we have reviewed will be as valuable to our successors as it is to us, the contemporaries of its author." Those words remain well justified more than a hundred years after they were written.

The description of the anatomy of the human breast is followed by a short but interesting section on the comparative anatomy. Moreover, he did not stop at a pure anatomical consideration but devoted twenty-four pages of the quarto volume to the physiology of lactation, including a description of the chemistry of milk, both human and comparative. The clinical importance of lactation receives notice, including the effect of the food taken by the nursing mother, the effect of the mind on the secretion of milk, and the effects of medicine, etc. He writes:

> A woman who has children and suckles them is undoubtedly a better insurable life than a married woman who has no children, or one who has remained single.

The acuteness of his observation is shown by the following:

> The breasts are slung upon the chest, supported by the fibrous tissue, and they are projected at the nipple *forwards* and *outwards*. I have, in my work on the *Testis*, pointed out the errors of those who paint or chisel from imagination, and not from observation of nature, in placing those bodies of equal height, although the left is usually much lower than the other; and the same remark may apply to the breasts, modellers, sculptors, and painters sometimes represent the nipples as being pointed forwards and place them as their imagination leads them to conceive them to be, and not as they really are. It is modern artists who fall into this error, for the ancients modelled from the living subject, and gave accurate representations of nature.
>
> This natural obliquity of the mamilla, or nipple, forwards and out-

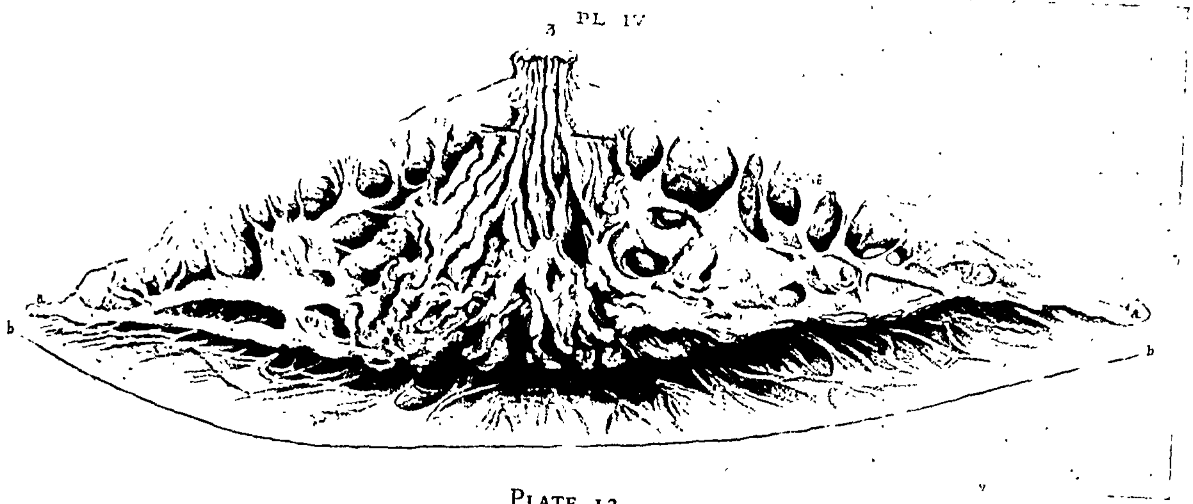


PLATE 12
Dissection of the breast to show Cooper's suspensory ligaments.

To face page 97]

> wards, with a slight turn of the nipple upwards, is one of the most beautiful provisions of nature, both for the mother and the child. To the mother, because the child rests upon her arm and lap in the most convenient position for sucking, for if the nipple and breast projected directly forwards, the child must have been supported before her by the mother's hands in a most inconvenient and fatiguing position, instead of its reclining upon her side and arm. But it is wisely provided by nature, that when the child reposes upon its mother's arm, it has its mouth directly applied to the nipple, which is turned outwards to receive it; whilst the lower part of the breast forms a cushion upon which the cheek of the infant tranquilly reposes. Thus it is we have always to admire the simplicity, the beauty and the utility, of those deviations of form in the construction of the body which the imagination of men would lead him, à priori, to believe most symmetrical, natural and convenient.

Cooper's suspensory ligament

The original description of Cooper's suspensory ligaments is worth reading, both for the specific information it gives and for the light that it throws upon the perfection, clarity and accuracy of his method of description. He was describing something new that he had himself observed; like all great contributors to human knowledge he presented his description in a polished and completed form. He restricted himself to describing from his own preparations; the actual specimens were available for all to inspect. His illustrations of the specimens are once more a series of masterly presentations, as the one reproduced here shows (Plate 12). "My rule", he writes, "has been always to publish that only which I could show to those who were sceptical and were yet desirous of arriving at the truth." It has been said that it was this self-evident truthfulness both as to statements and inferences, conspicuous in every page, that makes all his writings so valuable; "from this they all derive a worth which time cannot destroy, and which will always entitle them to be ranked among the noblest monuments of the epoch at which they were produced".

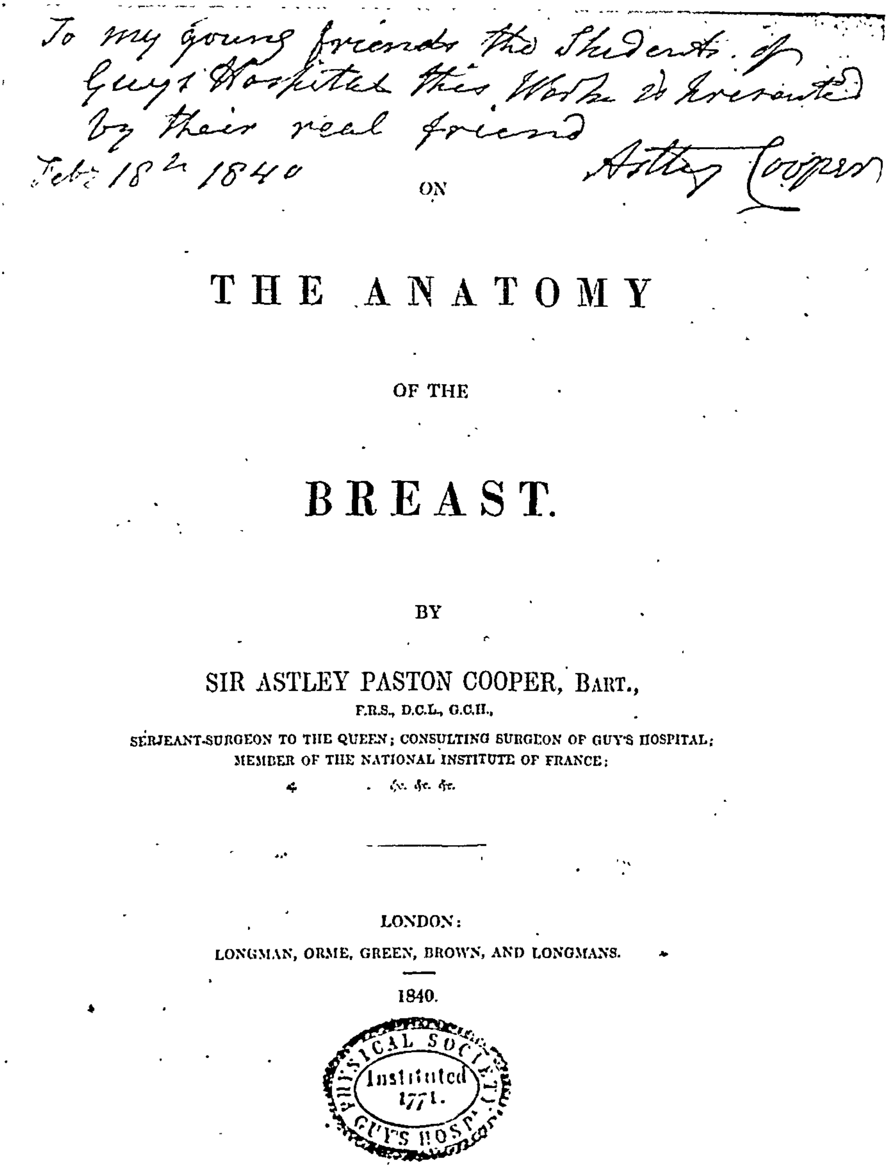
He writes of the fascia of the breast:

> The anterior or superficial layer passes upon the anterior or cutaneous surface of the breast: here it forms a fibrous covering, but not a true capsule, spread upon the surface of the gland, and passing between the gland and the skin; but it also enters the interior of the secretory structure.

> Here it sends out two sets of processes of a fibrous nature from its two surfaces.
>
> Anteriorly, large, strong and numerous fibrous or fascial processes, to the posterior surface of the skin which covers the breast, into the substances of which it is received, and with which it is incorporated.
>
> It is by these processes that the breast is suspended in its situation, and I shall therefore call them the *ligamenta suspensoria.*
>
> By these processes, the breast is slung upon the fore-part of the chest, for they form a moveable but very firm connexion with the skin, so that the breast has sufficient motion to elude violence; yet by this fibrous tissue it is, excepting under age, lactation, or relaxation, prevented from much change of place.
>
> The ends of these ligaments are spread out and incorporated with the posterior surface of the skin, and give it its whiteness and firmness.
>
> When raised and dried, the preparations of these ligamentous processes form a curious, irregular surface of folds, between the skin and the mammary gland. They are seen in a section of the breast, spread out and lost upon the inner surface of the skin at their anterior extremities. When the breast is placed in its natural position, the posterior extremities of the ligaments are spread over the fore-part of the gland, support numerous folds of the glandular structure, penetrate the substance of the organ, and everywhere connect the portions of glands to each other.
>
> A process of fascia proceeds to the nipple, surrounding the ducts which are contained within it, and it becomes the principal and very powerful connecting medium between the gland and the nipple, so as to prevent this latter important part from being separated from the breast by violence.

Unfortunately he was not to live to complete his volume on malignant disease of the breast, on which he was working when death came in 1841. The dedication of his last book, on the anatomy of the breast, was to the members of the medical profession; he addresses them as "My dear Brethren", and says: "If this work adds anything to your knowledge of the anatomy of the breast, I shall have received the utmost reward which I am anxious to obtain by its publication." As Sir Charters Symonds commented: "It was the swan song of a great teacher."

In the Wills Library at Guy's Hospital is an autograph copy in which he has written: "To my young friends the students of Guy's Hospital this work is presented by their real friend, Astley Cooper."



To my young friends the Students of Guy's Hospital this Work is presented by their real friend
Feb: 18th 1840 Astley Cooper

ON

THE ANATOMY

OF THE

BREAST.

BY

SIR ASTLEY PASTON COOPER, BART.,
F.R.S., D.C.L., G.C.H.,
SERJEANT-SURGEON TO THE QUEEN; CONSULTING SURGEON OF GUY'S HOSPITAL;
MEMBER OF THE NATIONAL INSTITUTE OF FRANCE;
&c. &c. &c.

LONDON:
LONGMAN, ORME, GREEN, BROWN, AND LONGMANS.
1840.

PHYSICAL SOCIETY GUY'S HOSP. Instituted 1771.

PLATE 13
Autographed title-page of Astley Cooper's last book.

To face page 99]

The title-page with the inscription is reproduced in Plate 13. What a revealing page it is! And what a wonderful ending to a long lifetime of studying and teaching and writing about that knowledge which is essential to the conquest of disease and suffering.

This chapter began with a quotation from a small man who belittled Sir Astley Cooper's attainments; let us end it with a quotation from a great man who appreciated the value of his writings. Sir Benjamin Brodie said:

> This we do know, that his published works will be studied as long as surgery is cultivated, and for this very reason, because they are replete with important facts, and containing the clearest rules of diagnosis, they will transmit his name to posterity with those of Sydenham and Hunter, as a great benefactor of the human race.

CHAPTER XIII

LECTURER AND TEACHER

WE have considered Sir Astley Cooper's achievements as a surgeon, as an anatomist, as a practitioner, as a research worker and as an author. He excelled in all these things, and it now remains to consider his success in yet another aspect of his work—that of lecturer and teacher. It is not uncommon to find ability and success in one or two of these activities, but it is rare to find all conducted in the same masterly manner. It is, perhaps, one of the most praiseworthy of Sir Astley Cooper's achievements that when great material success and fame came to him he did not abandon his routine work as a lecturer and teacher, nor did he lessen the time and interest given to it. For over thirty years he gave a series of lectures in surgery which attracted classes of a size never seen before and probably never since. If he had done nothing else this success as a teacher would have been remarkable by itself. It is difficult to apportion the proper value to his various activities, but his position and prowess as a surgical lecturer must rank very high; some would say that it was his greatest achievement in that he was thus responsible for the training of many surgeons and in this way the most widespread benefit came from his work.

The *British and Foreign Medical Review* said of him:

> As a teacher Sir Astley Cooper has never been excelled by any English surgeon. His discoveries were not hidden treasures; no sooner had he made them than he hastened, with liberal enthusiasm, and a winning affability, to diffuse a knowledge of them among a large class of pupils. The whole present generation of English surgeons may, indeed, be said to have studied directly or indirectly in his school; and, assuredly no master was ever more beloved and honoured, or sent more enthusiastic and grateful followers abroad into the world to propagate his doctrines.

His early appointment as Cline's assistant in giving the anatomy and surgery lectures at the United Hospitals has already been mentioned. This was in 1791 when he was but twenty-three years old, and he at once began to show the originality of his mind in that he was not content to follow tamely the scheme used up till then. Cline had given the anatomy and surgical lectures together and Astley Cooper was anxious to change this arrangement, which he felt was unsatisfactory. In the library of the Royal Society of Medicine is a manuscript copy of a student's note-book of the lectures given by Cooper in 1794, and the introductory lecture gives the details of this change of plan more clearly than I have seen anywhere else. We read:

> It has given Mr. Cooper surprise that people have not given a course of surgical lectures at St. Thomas's Hospital before. Mr. Cline lectures on the operations and the treatment they require after, but Mr. Cooper will begin with the diseases which do not require operation. Mr. Cooper will begin with inflammation and scrofula. . . . In the course of these lectures he will mix principles with practice and all hypothesis will be left out.

And in the next lecture:

> Mr. Cline at the end of his anatomical course gives us a description of the operations of surgery and cases requiring them, but Mr. Cooper conceived that this is not all that a surgeon ought to know; there is not as much difficulty in operating as has been apprehended, there are other complaints not requiring operation on which a surgeon's reputation frequently depends. In speaking on diseases Mr. Cooper purposes first giving the symptoms and afterwards comparing them with the internal alteration which has gone on and which is apparent by dissection, without which knowledge it is impossible to adopt a proper remedy.

Remember that this student's note-book is over 150 years old and its most enlightening and interesting notes reveal quite clearly why Astley Cooper was anxious to make the change from Cline's method of lecturing. It also shows that he was the first surgeon at the United Hospitals to conceive and deliver a comprehensive course on the principles and practice of surgery.

A paragraph in the preface to the third edition of Fox's *Lectures on Dental Surgery* shows that Astley Cooper was also mainly responsible for instituting the course of lectures in dental surgery which was begun at Guy's Hospital in 1799. This acknowledgement comes from Fox himself and emphasises once more Astley Cooper's clearness of vision and his ready willingness to do everything to further the proper teaching of his students.

Joseph Fox had attended John Hunter's lectures on the teeth, but carried his work much further forward into practical dental surgery. He is said to have been the first dentist in England to write a scientific work on the teeth and to give lectures at a medical school. The lectures begun in 1799 were given by Fox until 1825 and have been continued by other lecturers in an unbroken series until the present day, although the Guy's Dental School was not actually founded until 1889. Guy's was the first hospital in which lectures were given in dental surgery and this even before it possessed a separate medical school. The Hospital owes this distinction in great part to Astley Cooper.

The plan that he adopted in his surgical lectures was attractive and practical. He would introduce his subject by presenting patients then in the hospital who illustrated the disease conditions he wished to discuss, and would then give a thorough and systematic account of the fundamental physiological and pathological surgical principles involved. This would be followed by logical deductions as to treatment and an account of the practical steps of treatment. In this connection the last paragraph of the student's notes quoted above should be read again as they outline the fundamental, "without which knowledge it is impossible to adopt a proper remedy". The almost revolutionary character of this cannot be appreciated to-day unless it is known that until then much of medicine and almost all surgery had been founded on empiricism and quackery. Hunter first led the way to a correct understanding of what was needed for the science of surgery; to Astley Cooper is due the credit of putting this into practice and spreading the gospel to the many thousands of students who came to his lectures.

The lectures were illustrated and made more valuable by frequent references to cases in his vast clinical experience, by many excellent specimens and dissections, by drawings or paintings, by operations on animals, or by careful demonstrations of operations on the human cadaver. In this way a full and comprehensive course of lectures covered the whole field of surgery, and when we remember that it was delivered in an attractive and agreeable manner by a man who was greatly admired and respected for his practical attainments as well as for his own likeable personality, it is no wonder that students flocked in such numbers to hear him, and that he came to be known as the greatest surgical teacher in Europe. His students came from Great

Britain, Germany, Italy, Switzerland, France, Denmark, Sweden and America. In later life when he travelled on the Continent and in Great Britain he found old friends wherever he went; pupils or dressers amongst the many thousands who had heard him teach welcomed him on every side.

It should be remembered that as well as the surgical lectures, which he gave on three evenings a week for many years, he also lectured on anatomy every afternoon from two o'clock until half-past three. Later two of the afternoon lectures were given by his demonstrators.

Flint South of St. Thomas's writes in his memoirs:

> A few moments before two, Astley Cooper came briskly through the crowd, his handsome face beaming with delight and animation. He was dressed in black with knee breeches and silk stockings, which displayed his handsome legs, of which he was not a little proud. In the theatre he was greeted with long and continued applause. His clear silvery voice and cheery conversational manner soon exhausted the conventional hour devoted to the lecture. All who heard him, hung with silent attention on his words; the only sound which broke the quiet was the subdued scratching of the note-taker. He had no pretensions to oratory and spoke with a rather broad Norfolk twang. He was one of the most attractive lecturers I have ever heard and as he only talked of what he really knew from his own experience, he was implicitly trusted. He was an example of one who knew his subject well and did not fail to impart it to others.

The first number of the *Lancet* was published on October 5th, 1823, at the beginning of the academic year, and it contained an account of Sir Astley Cooper's opening lecture. The scene it describes can well be imagined.

> At half-past seven the theatre was crowded in every part by upwards of four hundred students of the most respectable description; in fact we never before witnessed so genteel a surgical class; the sight was most pleasing, for they all appeared gentlemen of cultivated manners and good education.

The opening lecture was usually in the nature of an address to the students such as is given at the beginning of the academic year to-day; many parents sat with their sons and the attention of the whole vast audience would be centred on the handsome figure of the distinguished lecturer who had proved himself fully worthy of the interest and confidence accorded him. Sir Astley Cooper, by his achievements and the excellence of his discourse placed the United Hospitals in the front rank of European medical schools for more than a quarter of a century.

Astley Cooper never published his lectures himself. They were taken down as notes by the students who were supposed then to re-write them in full later in the day. Several manuscript copies made in this way by students are still extant. Some of these may be seen in the Wills Library at Guy's Hospital and also in the Royal College of Surgeons. The best copies at Guy's are by a student named Joshua Waddington, and are written in a beautiful hand on one side of a page about quarto size. The whole series is bound in calf and has a title-page in copperplate by Waddington and a beautifully done contents page and index. Astley Cooper's lectures on anatomy take up two volumes, one of 559 pages and the other of 545. The lectures on "the Principles and Practice of Surgery delivered at the Theatre in St. Thomas's Hospital between the 1st of October 1815 and the 1st of June 1816", are in one volume of 667 pages. The careful labour expended by Waddington in these three volumes must have been considerable, but their very size emphasises the great labour that Sir Astley Cooper must have gone to himself to deliver this series every year from 1792 to 1825. The student who wrote up these lectures and demonstrations as he was meant to do thereby provided himself with his own text-book in anatomy and surgery, and in this way Astley Cooper's lectures constituted the standard text-book of the day. Naturally all students were not as conscientious as Joshua Waddington! One of the less industrious was John Keats, who was a fellow-student of Waddington and attended the same lectures. His note-book is preserved in the museum at Hampstead and a limited edition has been issued in a printed form. If it is compared page by page with Waddington's it will be seen that Keats's notes were often scrappy and incomplete and were apparently not written up in full at all (Winston, 1943). South mentions that it was on Astley Cooper's advice that Keats took lodgings at Markham's, the tallow chandler's, in St. Thomas's Street. Keats wrote several of his finest poems here, including "Endymion" and the sonnet on Chapman's *Homer*.

The connection of the *Lancet* with Astley Cooper's lectures demands special consideration. Thomas Wakley, the founder and editor of the journal, had been a student of the United Hospitals. He was a stormy petrel of medical journalism and he intended in the *Lancet* to present to a wide audience the teaching and knowledge which came from the great London hospitals and medical schools, and also by agitation to correct what he felt were certain abuses in the conduct of medicine and surgery. The practice of reporting lectures was then unknown and was considered a reprehensible thing to do; the lecturer who condoned the practice was himself open to the charge of advertising. It is difficult for us to-day, who are familiar with the modern great weekly medical journals with their regular reporting of lectures, society meetings and general and special articles, to realise what a revolutionist Thomas Wakley was.

He was also a very good journalist and he showed this in his decision to include a report of Sir Astley Cooper's lectures in his first series.

Sprigge says in his biography of Wakley:

> The publication of Sir Astley Cooper's lectures in the place of honour of the new paper had proved a fine stroke of journalism—of that there could be no doubt. The lectures possessed all the qualifications that an editor could desire for his most important articles. They were excellent in material, wise, practical, and easy to follow. A large class of readers might be expected constantly to buy a paper which contained such contributions. To those seeking instruction in the broad roads of surgery as much as those desirous of revising their knowledge of the obscurer by-paths the light shed upon their course from the clearest surgical intellect of the day was equally valuable; and Wakley could count confidently upon a respectable number of subscribers desirous of obtaining such help and such only from the paper and quite indifferent to questions of medical policy or medical reform. In short these lectures attracted and held readers. Hardly less important from a business point of view was the prestige that their publication conferred at once upon the *Lancet*. For they had what first-class and useful work does not always have—that is a widely known and distinguished signature. Sir Astley Cooper's was at the time a name to conjure with. He was at the highest point of his professional fame, his unrivalled surgical reputation being enhanced by his wealth, his handsome person, his popularity with his pupils, his recent title, and his acknowledged position in the social world. It was impossible for the public or the profession, for rival journals or for the frightened

owners of vested interests, to cry down the *Lancet* as a worthless gutter production while Wakley was issuing in its pages week by week the work of such a man, and doing so without formal protest from the lecturer. The note of scientific importance once struck by the editor gave the key to his journal.

We can have no better proof of the esteem in which Sir Astley Cooper was held as a lecturer and teacher than the above words of Sprigge. Wakley himself in his preface to the first number of the new journal writes:

> It has long been a subject of surprise and regret that in this extensive and intelligent community there has not hitherto existed a work which would convey to the public, and to distant practitioners as well as to students in Medicine and Surgery, reports of the Metropolitan Hospital lectures.
>
> Having for a considerable time past observed the great and increasing inquiries for such information, in a department of science so pre-eminently useful, we have been induced to supply in the most ample manner whatever is valuable in these important branches of knowledge; and as the Lectures of Sir Astley Cooper, on the theory and practice of surgery, are probably the best of the kind delivered in Europe, we have commenced our undertaking with the introductory address of that distinguished professor given in the theatre at St. Thomas's Hospital on Wednesday evening last. The course will be rendered complete in subsequent numbers.

The publication of this lecture and the promise of the whole course of lectures staggered the teachers of the London hospitals. As the new numbers appeared, each with a fresh lecture under Sir Astley Cooper's name, charges of advertisement were levelled at him. It is to his great and everlasting credit that he apparently did not object to the publication of the lectures and the wider dissemination of his teaching thus resulting. He doubtless realised the essential justice behind Wakley's avowed principles and that it was useless and ignorant to attempt to suppress such a reform. Moreover, no man, however secure in his position already, could fail to be sensible of the honour accorded him of being selected as the one whose teaching was to be dealt with in this manner.

He did, however, strongly object to his name being printed at the head of the lectures and also appearing in the lay papers which quoted freely from the *Lancet*. He told his surgical class:

> Now, gentlemen, though I did not regard the publication of my lectures I felt myself disgraced and degraded by my name forever appearing in the diurnal press. Not a paper could I see but my name flourished in it in some form or other. This looked so much like quackery, so much like puffing, that I am unable to describe to you how much it annoyed me.

The *Lancet* appeared with great secrecy and suddenness and at first the identity of the editor was not known. After some weeks Astley Cooper learnt that it was an old pupil of his who was responsible for the unauthorised publication of his lectures and he went personally to Wakley's house in Norfolk Street to confront him. The story is told that he gained admission to the house in the character of a patient and caught Wakley, who at the time believed his secret to be inviolate, in the very act of correcting a proof of one of the lectures. Wakley's discomfiture was obvious, and Sir Astley Cooper was so pleased with the success of his plan for confronting the editor that any anger that he felt evaporated at once and he burst out laughing. He and Wakley then settled down to an amicable discussion of their views, and an agreement was reached. Sir Astley Cooper was not to object to the publication of his lectures, and Wakley was to refrain from printing his name in connection with them. This guarantee to suppress the author's name came into force in the tenth number of the *Lancet* and was loyally observed. Sir Astley Cooper, for his part, raised no further objections to his lectures being used in this way.

As Sprigge says:

> Sir Astley Cooper's attitude can be called professional but friendly. He had the foresight to know that wide dissemination of correct surgical teaching must be for the benefit of the profession of which he was the head. He had the acumen to see that to set up a claim to exclusive property in spoken words would be attended with legal and moral difficulty.

But not so other lecturers in London. Abernethy of St. Bartholomew's was considered to rank next to Astley Cooper in eminence, and when his lectures were also published without his consent he determined to make it a basis for legal action. It was held that the lecturer possessed a copyright and that the publication of his discourse without his permission was an infringement of this copyright. He sued Wakley for damages, although there is no doubt that he was selected to fight the battles of all his colleagues in this. This is no place to go into the legal arguments that followed, but it is sufficient to say that eventually Wakley won the day.

The great success of this publication of the whole course of Astley Cooper's lectures suggested to his associates that the lectures could well be published in book form, for in the following October Tyrrell, who was one of Astley Cooper's apprentices and later surgeon to St. Thomas's Hospital, published a volume of twelve lectures. Wakley could not object to this, since by his own showing no one held a copyright to the lectures, but Tyrrell unfortunately used the *Lancet* text, even to the extent of reproducing errors made by the reporter in transcribing, without acknowledging the source. Wakley was indignant and began an attack on Tyrrell, later provoking him by frankly libellous remarks so that another lawsuit resulted. A most unfortunate episode that speaks no credit for Wakley. In 1825 and 1827 Tyrrell published two more volumes, thus giving the complete course of the lectures.

Other editions followed, some by other editors; the lectures were also published in America, and three editions were translated and published in Germany. Cooper's *Surgery* thus became the standard textbook of the day and held this position for many years after his death. The last rendering was by Lee, also a three-volume work. The monographs on hernia, fractures and dislocations, the testis and breast are also incorporated in these, making a very impressive and comprehensive series further embellished by illustrations. Even to-day these lectures well repay reading for the sound and excellent surgical instruction they contain. The parts that are out of date are still interesting and instructive to anyone ready to learn of the progress of surgery. Many references have been made to the substance of these lectures in this book and in the last chapter they were freely quoted. In the next chapter one of the lectures is printed in a slightly shortened form.

Astley Cooper's teaching was built up essentially from his own observations and experiences, many of them original and arising from his energetic and enquiring mind. He did not hesitate to refer to the writings and works of others, either to recommend them or advise against their teaching if necessary, although he did not read widely.

His discourse was enlivened by a constant stream of stories and instances drawn from his vast clinical and human experience, which serve to attract the attention even to-day and must have added greatly to the merits of the lectures when they were originally delivered. In addition to the actual surgical knowledge that he dispensed he was insistent on teaching the correct way to learn and study surgery. He was absolutely against "spoon-feeding", and was constantly impressing upon his students the need and value of personal observation. In an earlier chapter his remarks were quoted condemning the reliance upon hypothesis in medicine and surgery. In *Surgical Essays*, page 114, he writes:

> In collecting evidence upon any medical subject, there are but three sources from which we can hope to obtain it: *viz.* from observation on the living subject; from examination of the dead; and from experiments upon living animals. By the first we learn the history of disease; by the second, its real nature, so far as it can be certainly known; and by experiments upon living animals we ascertain the processes resorted to by nature for restoring parts which have sustained injuries, and then apply that knowledge to accidents in man.

And again:

> It is my duty to state to you my opinion; you must think for yourselves, only do not rest contented with thinking; make observations and experiments, for without them your thinking will be of little use.

We know that from the days that he first went to Hunter's lectures as an apprentice he followed this doctrine closely and checked his observations and teachings by animal experiment. Nor did he ever relax in doing this, and all through his life was modifying, expanding and improving his teaching as a result of constant observation and enquiry. In later years, before the Committee of Enquiry into Medical Education, he was most emphatic in his contention that a teacher or examiner should keep abreast of advancements in knowledge *and also take active part in those advancements himself.* Although he occupied no official chair in surgery from a university he was the perfect professor, and indeed in the reports of his lectures is usually referred to as "the learned professor".

His recognition of the indispensable value of post-mortem observation was absolute, and we know the lengths to which he would go to achieve his end in this. Many teachers were then not impressed with the need for the study of morbid anatomy, and Astley Cooper's students owed much to him for his constant urgings not to neglect it. According to Sir James Paget he deserves honour for having been one of the few who, in the beginning of the nineteenth century, promoted the science of pathology by the study of morbid anatomy; for at that time there was no department for the demonstration or teaching of pathology either in London or anywhere else in the country. The valuable part played by his museum in this connection is described in a later chapter.

He was also insistent on the value of proper note-taking in clinical work; throughout his life he himself relied fully upon proper notes and their analysis, and even when travelling on his rounds would have a secretary or dresser in his carriage to take notes at his dictation. These notes were used extensively in his writings. Case reporting was not then compulsory for students and his urgent insistence on its value was all the more important. Before he was appointed to the staff his interest in this aspect of the training of students led him to form a private medical society at which cases could be presented. Later a Clinical Report Society was formed and, later still, case reporting was incorporated as a routine of medical training; but in his day the students had to rely upon the stimulus that came from his admonitions if they were to benefit by it.

The advice given in his lectures also included his views on the general conduct of life and in particular the proper conduct of a doctor. In one of the student's note-books preserved in the Wills Library at Guy's the following, and not unamusing, passage occurs in the introductory lecture:

> . . . Give me leave to remind you, gentlemen, that in your conduct here will probably depend your future rank in life. I have known at these Hospitals between three and four thousand pupils and it has been the result of my observations that universally those who were studious and attentive during their attendance here have gradually advanced to a responsible station, whilst those who were careless and idle and lounged away their time in public-houses have met with confusion and disappointments, and never been able to maintain a responsible station in life.

He insisted upon a proper relationship between medicine and surgery. We must accord to John Hunter the first praise in this connection for before his time surgery was held to have but little connection with medicine. The surgeon was to act at the behest of the physician who alone was supposed to possess a proper knowledge of disease. Hunter showed that efficient medicine and surgery must both depend on a common understanding of the fundamentals of anatomy and pathology but Astley Cooper also did much to further this truth. He insisted that the surgeon should understand medicine and that the good physician should also be acquainted with surgical principles.

> The study of medicine is important to the surgeon; he should be able to prescribe with certainty; should well understand the great influence of local disease on the constitution, as well as the *origin* of local disease from constitutional derangement. Without such knowledge he knows but half his duty. On the other hand, a mere physician cannot be a good judge of surgical cases . . . that a physician should not interfere with patients of this description is evident; but I do not mean to say that one profession is to be upheld at the expense of the other; far from it, indeed they should mutually assist in the great duty of preserving human existence.

He felt strongly that a certain amount of general medical practice was of value to the surgeon, and his own vast practice certainly contained not a little "general practice"; it was by no means confined to pure consulting surgery. This was inevitable in the conditions of practice at that time.

Although most has been said about Astley Cooper's lectures, which were true *clinical* lectures as they were accompanied by the presentation of patients, he was also a great bedside teacher. We have read of the large crowd of students who daily met him on the colonnade steps and accompanied him on his round of his wards. Pettigrew, in his *Medical Portrait Gallery*, says:

> He was the idol of the Borough School. The pupils followed him in troops; and like to Linnaeus, who has been described as proceeding upon his botanical excursions accompanied by hundreds of students, so may Sir Astley be depicted traversing the wards of the hospital with an equal number of pupils listening with almost breathless anxiety to catch the observations which fell from his lips.

In 1824 Astley Cooper's health began to deteriorate; his attacks of giddiness became more frequent and he suffered from occasional attacks of dyspnoea so that he became alarmed. He decided that the attacks were in great part due to the strain of lecturing, and so at the beginning of the autumn session he abandoned the lectures on anatomy and delivered the surgical lectures only. At the end of the first term he decided to stop lecturing entirely and in January 1825 sent in his resignation to the governors of St. Thomas's Hospital. The repercussions that followed this step were considerable, but an account of them must be left to a later chapter. In this way ended a lectureship in surgery that had been held for over thirty years and had brought no less renown to the United Hospitals than to the distinguished lecturer himself. Some two or three years later he was induced, as a result of a request by a body of students, to give a few lectures on anatomy and a few in surgery at Guy's Hospital. As might be expected, he was received enthusiastically and the theatre was crowded with students. He found, however, that the excitement of the scene, the emotion it caused and the strain of lecturing were again too much for him and increased the frequency of the attacks from which he suffered. He therefore was compelled to abandon lecturing completely. In 1830, when he was some sixty-two years of age, he was again asked to lecture by a large body of students. Because of his health he declined, saying also that it was the duty of men advanced in years to make way for younger men who were able to give vigour and energy to their teaching.

> As my experience is great, my opinion may still be useful, and, therefore, I continue to practise, and to employ myself in writing that which I have seen; but lectures, after the age of sixty, must be left to others.

We have here the reason for the great output in monographs that followed his resignation from hospital duties and which was described in the last two chapters. The energy that he had been expending for so many years in delivering the spoken word could not rest, even though the obligation to teach no longer remained. He felt it his duty to record his views and experiences and, great teacher that he was, he used his declining years to do so.

CHAPTER XIV

A LECTURE BY ASTLEY COOPER

IN order that the reader may judge something of the clarity and merit of Sir Astley Cooper's lectures, it was decided to reprint a selected one in this biography. The one chosen has been slightly abridged, and is Lecture 20 in Lee's edition, Volume I (1837).

It was chosen because it illustrates many of the points of excellence in the lectures. It deals with an important and practical subject, which is systematically presented; it was illustrated by many specimens and is enlivened and made more valuable by references to relevant cases. It reveals a wide and deep knowledge of pathology, medical as well as surgical. How many surgeons of to-day could speak as authoritatively on the pathology of aneurysm and particularly of aneurysm of the aorta?

The account of the treatment of aneurysm is logical and complete. It contains interesting facts about the development of the surgical management and the evolution of the Hunterian method of proximal ligation, while paying proper tribute to Hunter. It concludes with a practical demonstration of the actual operation of ligation of the femoral artery for popliteal aneurysm.

LECTURE ON ANEURISMS

THE SIZE OF ANEURISMS

The aneurism before me is the largest I ever saw (a beautiful specimen was here exhibited): it begins in the aorta at the emulgent arteries, and extends into the cavity of the pelvis. It contained blood (and I am not exactly certain how much), but of an enormous weight. Here (showing another specimen) is a popliteal aneurism of considerable size. The greatest number of aneurisms that I have seen in one case is seven, and this specimen on the table was taken from the man to whom I allude. He died of an aneurism at the bifurcation of the aorta; he also had one at the opposite ham, two above it, one in the groin, and two others. The iliac artery had been tied for femoral aneurism, and the patient did well for some time, but afterwards died. This man was a bricklayer's labourer;

had been accustomed to mount ladders, and carry weights up great heights; had been in the habit of exercising his lower extremities a good deal: he was not very muscular, and the fatigue of his occupation was more than he could bear.

I may observe here, that some aneurisms are local, and others general; when they occur in the ham, they are frequently only local; but when between the groin and ham, or in the middle of the thigh, you very commonly find disease of other arteries. Therefore, in popliteal aneurism, you expect to find the aorta and larger arteries healthy.

The age at which aneurisms generally occur is from 30 to 50; at that age, exercise is considerable and strength less. In very old age this complaint is not so common. I have seen a popliteal aneurism in a man of 80, four or five years ago, at the other hospital: on this man I tied the femoral artery, and he did extremely well. On a man of 69 I have operated, and that case did well. I saw a boy in this hospital, 11 years old, with aneurism of the anterior tibial artery. The man of 80 is the oldest, and the boy of 11 the youngest, that I have seen with aneurism. It is more commonly met with between 30 and 50, or rather between 30 and 40, than after that time. In cases of aneurism, the age is no objection to the operation.

With respect to the sex in which aneurism chiefly occurs, the male is certainly much more frequently the subject of it than the female. I should say that the proportion of males to females is about five to one; and if we take only cases of popliteal aneurism, the proportion of males would be considerably greater. When aneurisms do occur in females, they are generally internal. Females are rarely the subjects of aneurisms in the limbs; the reason of which is, that they do not exert them so much as the other sex. In the course of my practice, taking hospital and private practice together, I have seen about eight cases of popliteal aneurism in the female. The number of popliteal aneurisms which I have seen in the male is of course very considerable.

ON THE FORMATION OF ANEURISMS

It is necessary that you should clearly understand the manner in which aneurism is produced. The first circumstance that takes place in an artery which is about to produce an aneurismal swelling is, that it becomes opaque, and slightly inflamed. A small yellow spot appears in the part where the aneurism is afterwards formed, and there is a slight efflorescence surrounding it. The process of absorption afterwards takes place, and thins the coat of the artery, so that the texture becomes like that of a fine web. At the same time that this takes place, nature begins to set up a process of defence, which is beautifully exemplified in a preparation (it was exhibited to the class) made from the first aneurism which I had an opportunity of dissecting. This was an incipient aneurism of the aorta; you perceive that the coat of the artery has been absorbed, and opposite to the parts absorbed you observe a layer of adhesive matter, by means of which is a defence set up for the coat of the artery, and the progress of the disease for a time resisted. A covering is thus produced by the adhesive inflammation which shuts up the artery, so as to prevent the immediate escape of the blood.

This preparation not only beautifully illustrates this process, but, by holding a candle to the opposite side of it, you will also observe the opacity which I have just described. As the coat of the artery becomes absorbed, the cellular membrane is glued by this matter to the outer surface of the artery. The next substance which becomes absorbed, if it be an aneurism of the ascending aorta, is the pleura, which forms a portion of the aneurismal bag. Then the lungs become absorbed, and form a portion of the bag; next the intercostal muscles, with the cartilages of the ribs; then the pectoral muscle; and at last the skin itself, forming the parietes of the aneurism, gives way, and there is no longer anything to prevent the escape of the blood.

Every aneurism was formerly supposed to be produced by the dilation of the coats of the artery; but it has been found that this is not the case. It is generally produced, not by the dilation, but by the absorption of the coats of the artery. For this knowledge we are indebted to Scarpa, who first accurately explained the mode in which aneurisms are produced. He thought they were always produced in this way; but they are sometimes, though rarely, formed in the way in which they were formerly supposed to be uniformly produced; namely by dilation. Here is a specimen of an aneurism of the aorta, in which the pouch is formed by dilation, the coats of the artery still remaining.

The general cause of aneurism is a diseased state of the coats of an artery, by which it becomes altered in its appearance, and thinner in its texture; but this, although the most frequent, is not the only cause of the disease, for sometimes the artery becomes dilated in its whole circumference, as may be seen by two beautiful specimens in our museum.

Aneurisms are now and then the effects of the bursting of an artery, under some considerable exertion. I have known two instances of this kind. A gentleman who was out shooting, jumped over a ditch, when, on reaching the other side, his foot slipped, and he fell back into the ditch.

At this moment he felt something snap in his ham, and when he attempted to walk, he found himself lame from the accident. He was attended by Mr. Holt, a surgeon, at Tottenham, and was afterwards brought to town, where he underwent an operation for popliteal aneurism. In this case, the aneurism began to form within a very short time after the accident, and it was not more than from three to five weeks afterwards that the operation was performed.

The other case in which I have known an aneurism produced by the bursting of an artery, occurred as follows: A gentleman whom I was attending for another complaint, in attempting to raise himself in bed upon his hands, felt something snap in his right hand. When I next visited him, he told me the circumstance, and requested me to look at his hand. Upon putting my finger upon it, I felt a pulsating aneurismal swelling. I tried what could be done by pressure; but as this did not succeed, I found it necessary to tie the radial artery at the part where we usually feel the pulse. In this case, a bag of considerable size was formed by the cellular membrane, instead of the usual mode.

A pointed body introduced into an artery will produce all the appearances of aneurism, and require the same treatment. In whatever way, in short, aneurism is produced, the surgical treatment of it will be the same.

Diagnosis

You may distinguish aneurism from other diseases by the following marks: If the aneurism be recent, by pressing your finger on the artery which leads to the aneurism, you will empty the aneurismal bag; but if the aneurism be of longer duration, and the pulsation be but slight, place yourself by the side of the patient, observe carefully the size of the swelling, and by pressing your finger on the artery above, you will see the aneurism sink down as you make the pressure, though the sac will not entirely empty itself; and upon raising your hand suddenly, you will observe a jet of blood rush into the aneurismal sac, and raise it to its former height.

In this manner an aneurism may be easily distinguished from another tumour deriving its pulsation from an artery: in the former case, the pulsation will be felt over every part of the tumour, in the latter there will be no pulsation, except in the direction of the artery. I have hurried over some parts of this evening's lecture, as it is my intention to show you the operation for popliteal aneurism, having a subject which will answer the purpose extremely well. I shall postpone, therefore, some remarks which I have to make upon the medical treatment of aneurism, and proceed at once to speak of the surgical operation for its cure.

A LECTURE BY ASTLEY COOPER

ON THE CURE OF ANEURISMS

Spontaneous cure

Aneurisms sometimes undergo a spontaneous cure. This is a circumstance which you should bear in mind, because in cases where they are so situated as not to admit of surgical relief, it is a consolation to the patient to know that these diseases now and then cure themselves. There are many examples of such a spontaneous cure: I have myself seen some, and many more are to be found in surgical and medical authors.

There is a preparation before us, taken from a man in the other hospital, who had an aneurism, situated just below the groin, which underwent a spontaneous cure. He was sitting before the fire, in one of the wards of the hospital, when he felt something burst in the upper part of his thigh. On examination, he found no blood had issued out, and, in fact, the aneurism had not yet reached the skin so as to be adherent to it. His thigh was, however, enormously swollen; he was unable to use the limb, and was put to bed by the other patients. For three days after a pulsation was found in the aneurism; it then ceased, and the size of the limb began to diminish. At the end of four months the aneurismal swelling had considerably diminished, and he recovered the use of the limb. Six months after he first felt this sensation, and when he had been discharged from the hospital, I met him as I was walking across the square of the other hospital, I said to him, "Why, Powell, you seem low-spirited; you ought to be cheerful, for you have had a narrow escape." "Yes," said the man, "I am pretty well, sir, except that I have something alive in my belly." "I hope you have," said I, "for it would be rather awkward if you had not." On putting my hand on his abdomen, I felt a pulsating swelling there. This aneurism shortly afterwards burst into the abdomen and the man died. On examination of the body, it was found that the aneurism in the thigh, just below Poupart's ligament, had burst under the fascia lata; a great accumulation of blood took place, which pressed upon the vessel, and the femoral artery was obliterated. Sir W. Blizard had a patient at Walworth, with popliteal aneurism, which was cured spontaneously. Mr. Ford mentions several cases; and Dr. Baillie met with two cases of carotid aneurism, which cured themselves. Mr. Crampton, the surgeon-general at Dublin, has given an account of a case in which the aneurism gradually wasted in the abdomen, and obliterated the aorta.

An account of a similar case has been given by Baron Larrey, the French surgeon. An Irish gentleman, whose name does not at this moment occur to me, in passing through this metropolis, on his way to

Paris, showed me a preparation from a case of spontaneous cure of aneurism, in which the aorta was obliterated at the loins.

Medical treatment

From the medical treatment of this disease, I must confess that I have seen but little advantage. Mr. Brown, a surgeon, who had an aneurism of the aorta, was exceedingly strict in his diet and in his exercise; but he lived only a very few months. A gentleman, who had an aneurism of his aorta, took four ounces of food three times a day, and refrained almost entirely from exercise; and although he began this plan in August, almost as soon as the disease was distinctly discovered, yet he died in the following February. The result of my observation is, that two measures only are useful; the one, abstraction of blood from the arm, when the pulse is hard and full, from which I have seen undoubted benefit arise. The other, the administration of the carbonate of soda, in considerable doses, which, with entire rest, seem to prevent the increase of the swelling: but the soda is at last obliged to be abandoned, on account of its producing petechiae; the irritability of the body is often so increased by an anti-phlogistic treatment, that the quickness of the pulse which follows, does as much injury as the natural force of circulation.

On the operation for aneurism

As the spontaneous cure of this disease, however, cannot be so far depended upon as to prevent us from performing the operation in all situations where the artery is accessible, I shall proceed to describe to you the mode of performing the operation in the different parts of the body, confining myself in this evening's lecture to the operation on the femoral artery. As we are occasionally under the necessity of performing the operation as it used to be done thirty-five or forty years ago, I shall, in the first place, say a few words on the old operation.

Old method

The operation for popliteal aneurism used to be performed in the following manner: A tourniquet was placed on the limb, and the patient laid upon his face. An incision was then made in the ham, to the extent of the aneurism, and the adhesive matter and coagulated blood removed from the excavation thus made. The aneurismal bag was then wiped out with a sponge, and the tourniquet was slightly loosened, in order to mark the orifice of the artery. The surgeon stood ready with a probe in his hand, and as soon as he saw the blood issue from the upper orifice, he passed it into the artery, and then separating that portion of the artery from the remaining parts, put a ligature upon it. When he had done this, he again loosened the tourniquet, and as soon as he saw what appeared to be venous blood spring from the lower portion of the artery (for the blood from the upper portion of the artery is florid, as arterial blood usually is, but in the lower portion it has the appearance of venous blood), he introduced the probe into the orifice, and put a ligature on the artery as before. An operation like this, which exposed a very considerable surface, where the artery in the vicinity of the aneurism was diseased, and by which the bones were frequently injured, from the ulcerative process taking place, necessarily led very frequently to fatal results; so frequently, indeed, that it was a disputed point among the profession whether it was better to amputate in cases of popliteal aneurism, or to perform this operation. A man who had recovered after the old operation for popliteal aneurism could, formerly, get money by showing himself at the hospitals; at present it would not be worth a man's while to beg in this way.

Improved by Hunter

It is to the transcendent talents of that immortal genius Mr. John Hunter, that we are indebted for the great improvement which has taken place in this branch of surgery. But for Mr. John Hunter, we might still have the same difficulties to encounter, and patients labouring under this disease might still have been exposed to the same danger. Mr. Hunter being an excellent physiologist, and an admirable anatomist, applied the powers of his active and inquiring mind to the subject. He said: "I have frequently tied the femoral artery in animals, without injury; why should not I put a ligature on the artery, in the same way, in the human subject?"

Hunter's first efforts

It is right, however, to observe that Mr. Hunter was led to this train of thought by having under his care a case of popliteal aneurism, of such extent as to have reached the tendon of the triceps, so that there was no room for the application of a ligature between the aneurismal sac and the tendon. He determined, therefore, to make the experiment of tying the femoral artery, rather than amputate the limb. The first operation was not, as might be expected, performed in the very best manner. He was not content with a single ligature, but applied several, which were left hanging out of the wound, and which afterwards discharged by a process of ulceration. Yet under all these disadvantages, the patient recovered, and lived rather more than twelve months after the operation. On dissection, it was found that the femoral artery was obliterated as far as the arteria profunda. Since Mr. Hunter's time, several slight alterations have been made in the operation for popliteal aneurism, as every surgeon has his whim; but the principle established by Mr. Hunter remains the same, and that great surgeon has the undoubted merit of having substituted a simple and beautiful operation for one of very considerable difficulty and danger.

The operation for popliteal aneurism described

I shall proceed to point out to you the several steps of the operation for tying the femoral artery in cases of popliteal aneurism. Mr. Hunter used to make the incision in the middle of the thigh, but experience has shown that it is better to make it one-third of the space downwards from the ilium to the internal condyle of the os femoris, because the artery is more deeply seated in the middle of the thigh than it is higher up; and there are, besides, many anastomosing vessels in the former situation. There are four steps in this operation: first, an incision through the skin, which lays bare the sartorius muscle; secondly, the division is to be continued along the inner edge of the sartorius, exposing the sheath of the femoral artery; thirdly, the incision through the sheath; and fourthly, the putting of the ligature round the vessel. I now make the incision, about four inches in length—(the learned professor proceeded to perform the operation on the dead subject)—which completely exposes the sartorius muscle; I then separate its inner edge from the parts with which it is in contact; this lays bare the sheath, and I now find the femoral artery and the vein exposed. There is a little septum between the artery and the vein, which you should take care to observe. Introduce the aneurismal needle under the artery, taking care to disturb the parts as little as possible. Separate the cellular membrane to the extent of about an inch; and take care not to include the saphena nerve, which is a small branch of the anterior crural nerve, in the ligature. If the saphena nerve should be taken up, you will ascertain it by the irritability which is immediately excited. Having brought the ligature under the vessel with the aneurismal needle, all that remains is, to tie it with what is called a surgeon's knot, which does not slip. In this consists the whole operation. If you should have separated the artery from the sheath to any considerable extent, two ligatures will be necessary, which must be applied close to the part where the vessel is connected by the cellular tissue to the sheath; but if you should not have disturbed the artery, one ligature will be sufficient.

CHAPTER XV

ASTLEY COOPER'S MUSEUM AND SPECIMENS

UNTIL the end of his life Astley Cooper's main interest and activities, next to the actual practice of surgery, were devoted to the collection, dissection and preparation of specimens for his museum. These were collected for both teaching and research, and covered human and comparative anatomy as well as pathological conditions of every sort. His collection was second only to Hunter's in importance and was superior to it in its reproduction of surgical pathology. Most of Hunter's collection was concerned with pure and comparative anatomy, and his official position as Surgeon-General to the Army enabled him to obtain large numbers of specimens of many animals from all parts of the world. He was, however, not so successful in securing a big and steady flow of pathological specimens and consequently, although his museum was very complete in its representation of comparative anatomy, it was deficient in examples of diseased conditions. Astley Cooper, on the other hand, from his own hospital and private practice, from his association with other hospital surgeons and from the help and interest that he obtained from his assistants, old students, and doctor acquaintances all over the country, secured an enormous number of specimens illustrating all branches of pathology. Hence his collection in this respect was superior to the Hunterian one. Although not approaching Hunter's in its representation of comparative anatomy it was by no means paltry in this respect, for when he was professor of comparative anatomy to the Royal College of Surgeons, and gave lectures in 1814 and 1815, he collected a very large number of specimens and these were augmented by steady additions over many years.

The extent and value of Astley Cooper's work in this collection of specimens is not sufficiently well known, and unfortunately few know the fate of most of his material. He does not deserve this neglect and it is desirable that a fresh record should be made of his work and the present disposition of the specimens.

His museum activities date back to the time when he began to assist Cline in giving lectures in anatomy and surgery (1791). Preparations were made which were intended to illustrate the lectures, and a useful collection began to form. It was, however, very incomplete, and when the first part of his treatise on *Hernia* had been published in 1804 he found he had time to think more seriously of a project that was always near his heart, namely the formation of a private museum. From this time until almost the day of his death his exertions to this end continued unabated. He was then living in Broad Street and two rooms over the stables were fitted up as dissecting-rooms and were well equipped with all that was needed for the dissection, preparation and mounting of specimens. He spared no expense in improving the efficiency of these arrangements. He would allow no one into these rooms excepting his assistant or artist; in fact the door was always locked and the key removed if the rooms were left for only a few minutes.

He employed assistants to dissect for him, to make preparations and to arrange for securing post-mortem examinations, and artists to draw or paint or to make plaster casts. In addition to these paid helpers he managed by his enthusiasm and popularity to enlist the help of doctors everywhere in sending him material for examination and research.

His first assistant was a Mr. Lewis who came to him at Broad Street in May 1806, and who said that Cooper then had no more than twenty preparations in his house. The collection did not long remain at this low figure. Lewis usually began work in the dissecting-rooms at six o'clock in the morning and went on often until as late as eleven o'clock at night. Early as he was in starting, Cooper was usually before him and indeed made a habit of working every morning until about seven-thirty or eight o'clock when he went to breakfast. When he was preparing material for his lectures on comparative anatomy at the College he rose every morning at 4 a.m. and dissected until eight o'clock. He did this for months and at the time when his private practice must have been huge. Most of the specimens removed by operation in his private practice or at Guy's were brought here to be examined and dissected, and in addition he secured material from the post-mortem room and usually any other material that he needed from the hospital, for scarcely any of his colleagues were sufficiently interested in specimens from their own cases to want to keep them. This indifference to a proper collection of specimens apparently was widespread at the time and was one reason why John Hunter was able to form such an enormous museum.

Cooper devoted almost the whole of his leisure to the preparation of his museum and would thus use any odd moments that he could spare during the day. He would often spend half an hour at the end of the morning, after seeing patients at his house and before leaving to do his round at the hospital; this he would do even when patients were actually waiting to see him.

> He used to return to his occupation on these occasions, with all the zest of a schoolboy who had thrown aside for a time his books and his lessons and was stealing an opportunity of indulging in some favourite amusement.

In his later years when he was addressing the Committee on Medical Education Astley Cooper said:

> If I laid my head upon my pillow at night without having dissected something in the day, I should think that I had lost that day.

Cooper quickly found that preservation in spirits of wine caused many of his specimens to lose colour and other important characters, and he therefore made free use of artists to paint them when they were fresh. For many years he employed a full-time artist but later engaged one casually for separate pieces of work. The letter and the wax-model skeleton preserved in the Gordon Museum record also how it was at his recommendation that that remarkable genius Joseph Towne was given his life employment as modeller to Guy's Hospital; as a result the medical school possesses an incomparable collection of wax models of anatomical and pathological specimens.

His enthusiasm did not spring merely from the passion for collecting, but came from his desire to examine and research into the causation of diseased conditions and to discover a rational basis for treatment. His observations and conclusions derived from these studies formed much of the foundation of his published papers and spoken lectures. One of the most important uses which he made of the museum was to illustrate his routine lectures on surgery, and for a long time the specimens needed for the evening talk were sent down to the hospital in a hackney coach from his house.

The practice of transporting specimens between his house and the hospital went on until he and Cline agreed not to form private museums but to keep their collections at St. Thomas's Hospital. This was done in 1814 and Cooper's specimens were added to the ones already there when a new museum and lecture-room were "munificently erected by the Governors". Incidentally, although the hospital (St. Thomas's) contributed £3000 to this, the two lecturers contributed £1000 each. The actual museum collection was made almost entirely by Astley Cooper himself with great personal labour and expense, but he was willing to house it at St. Thomas's Hospital for the benefit of the students of the two schools.

When the separate medical school of Guy's Hospital was formed in 1825, Aston Key and Bransby Cooper, who were appointed to give the anatomy and surgery lectures at Guy's, asked that half of Astley Cooper's museum should be returned, but the St. Thomas's Hospital authorities refused to do this. They later paid Sir Astley a sum of money for his museum and he gave this as a contribution towards the building of the new medical school. The specimens, however, were retained by St. Thomas's and *remain there to this day*. It is strange that but few men either at Guy's or St. Thomas's know about them.

I recently (March 1951) visited the museum of St. Thomas's and, by the courtesy of Dr. Tait Smith, was able to inspect all the specimens that have survived. They total 68 and include 24 specimens used to illustrate his treatise on fractures and dislocations; this series alone is one that any surgical museum would be proud to possess for its intrinsic merit, quite apart from its historical interest and value; the specimens cover many types of representative fractures not easily obtained as museum specimens to-day. Astley Cooper's interest in research is indicated by a series of 21 specimens of simple fracture of the tibia in a rabbit intended to illustrate the degree of union over a period of 37 days.

There are seven specimens illustrated in his book on the testis, and six illustrated in his book on hernia. Amongst these are several of great interest, such as an example of reduction *en masse*, a traumatic diaphragmatic hernia, and two really fine and unique dried specimens, one of which shows a combined direct inguinal and an obturator hernia with the vessels injected to show their relationships on the deep surface of the pelvis; the other is a sciatic hernia with the adjacent vessels injected.

His passion for collecting specimens wherever he went is exemplified by one showing division of the femoral artery between ligatures from a patient operated upon by Chopart in Paris.

His inspiration to his pupils and assistants is shown by a series of five specimens of experimental observations on injury to the bowel made by Benjamin Travers.

It was an especial delight to find that the specimen from his case of ligation of the aorta has been safely preserved. It would have been a grievous loss if this had not survived the years.

The museum at Guy's has now but thirty-five of his preparations, only four of which are of any special interest; two of these show a ligature applied to a dog's aorta (one of which is shown in Plate 4), the third is a specimen of a hernia of the bladder into the inguinal canal mentioned in his lecture on hernia, and the last is the beautiful specimen of the collateral circulation secured eighteen years after successful ligation of the external iliac artery (see Plate 3). On the other hand many of his best specimens are at St. Thomas's; in particular one must mention the specimen from the human case of ligation of the abdominal aorta (Plate 6); the specimen from his first case of common carotid ligation has unfortunately been lost. All his collection of specimens of comparative anatomy used to illustrate his lectures at the College in 1814 and 1815 remained at St. Thomas's but are no longer in existence.

Soon after sending his collection to St. Thomas's Hospital, Astley Cooper moved from Broad Street to New Street and at once began again to accumulate specimens. But his new house did not have the same conveniences, and instead of putting the specimens in jars ready for a museum he put them in large bins and later sent them to Guy's where they were used to form the nucleus of a museum for the new medical school. That many of his specimens at both hospitals have been lost or destroyed in the passage of time is confirmed by Sir Charles Symonds's statement (1922) that many more were in the museum at Guy's in his student days.

After retirement from hospital work Astley Cooper still went on collecting, and at the time of his death had more than 1500 specimens actually mounted in jars in his own house. Many more were in tanks and other receptacles. In one of the manuscript copies of his catalogue, which are in the keeping of the Royal College of Surgeons, is a pencil note giving the number of bottled specimens up to a date a few years before his death. Very interesting and revealing are the odd headings here and there in the catalogue: "in Sir Astley's room", "in Sir Astley's study", "in the cupboard upstairs", etc., etc. Every available corner in his house must have been full of them!

After his death the whole collection went to the Royal College of Surgeons and is acknowledged as one of its most valuable acquisitions. A manuscript report on this collection, dated June 4th, 1841, is still preserved at the College and it states that there were over 2000 preparations, with a further miscellaneous collection of dry specimens amounting to 259. About three-fifths of the collection related to human anatomy; somewhat less than one-fifth to comparative anatomy and the remainder to pathology.

> The specimens are remarkable for the skill and clearness with which the structures are displayed. Many of them in this respect may be regarded as unique examples of anatomical art.

About 500 of the specimens were retained by the College.

I inspected them in 1940 but found it would be a big task to count how many remained as they were scattered in the different sections, but it appeared again as if many had been lost. Those that remained were beautifully dissected and prepared, especially the dried and varnished ones. Worthy of special mention are numbers 5531.1, 5534.1 and 13.1, which are specimens illustrating ligation of the carotid and vertebral arteries in dogs and rabbits; they are of great scientific interest from their experimental value and are, moreover, the original specimens of the work described in his article published in the first number of the *Guy's Hospital Reports* (1836). Luckily these specimens have survived, but unfortunately the terrible bomb damage later inflicted on the College and museum resulted in the destruction of almost all the Astley Cooper specimens. Only eleven survive that can be identified as his.

In spite of careful search at the Royal College of Surgeons, Guy's and St. Thomas's, it has proved impossible to find the specimen of his first case of amputation at the hip-joint. This is particularly disappointing as no detailed report has been made on it, and at the time of the operation some doubts had been thrown on its justification; doubts which Astley Cooper treated with silent contempt. The specimen must have been lost or thrown away with so many more.

In his search for fuller knowledge and understanding of disease and of the results of treatment, Astley Cooper fully appreciated the prime importance of post-mortem examination, and we owe him a great debt for the way in which, by both precept and example, he taught and insisted on the need for this. He would himself plead most eloquently and vigorously with difficult relatives if consent was being withheld. In Bransby Cooper's biography is an account of the virtual address he used to deliver on these occasions. He followed in his own case the demands that he made on others. His only child was examined by his own wish and he not only left instructions that an autopsy should be performed on his own body but also gave directions as to certain parts which he wished particularly inspected.

In order to study the very end results of his operations he would keep in touch with certain of his patients, either directly or through their doctor, if necessary for decades. In the first volume of the *Guy's Hospital Reports* (1836) may be found the account of the post-mortem examination on two of his patients, one of whom was operated on thirteen years and the other eighteen years before death. The completeness of the clinical presentation is remarkable in its thoroughness. If necessary he would not hesitate, when consent was refused, to employ resurrection men, and in this way obtained some of the best specimens of the final result of his surgical treatment. He would send the men to almost any part of the country. In one instance a local surgeon had watched a patient for twenty-four years and reported the death to Astley Cooper, who immediately gave instructions that the specimen was to be obtained "cost what it may". The bill for this transaction is as follows:

> 1820, June 1st. Paid Hollis and Vaughan for getting a subject from ——, in the county of ——, a man that Sir Astley Cooper performed an operation upon twenty-four years ago.

	£	*s.*	*d.*
Coach for two there and back	3	12	0
Guards and coachmen.		6	0
Expenses for two days	1	14	6
Carriage of subject and porter		12	6
Subject	7	7	0
	£13	12	0

Astley Cooper was the prince of collectors in this respect. This is well shown in the classic incident of his evidence before a select committee of the House of Commons on the proposed Anatomy Act, when he startled the members by his statement: "There is no person, let his situation in life be what it may, whom, if I were disposed to dissect, I could not obtain."

Finally there is the fascinating problem of Napoleon's intestines. When the museum was handed over to the Royal College of Surgeons, two small specimens of intestine were found which were described in his manuscript catalogue as: "Incipient fungus in the glands of an intestine. Napoleon. Barry O'Meara to Sir Astley Cooper" (Plate 14).

Astley Cooper had said nothing of his possession of these specimens during his lifetime, doubtless because of the considerable repercussions that might have occurred. The intense interest that must have been aroused by their finding can well be imagined. All that the description in his catalogue tells us is that he received them from Dr. Barry O'Meara, who was Napoleon's personal physician for three years at St. Helena, and that Cooper thought they contained a cancerous growth.

Great and bitter controversy has raged around these relics and many commentators of repute have declared them not to be genuine. All interested in the subject should read the absorbing and scholarly Hunterian lecture delivered by Sir Arthur Keith in 1913. By careful and precise argument and examination of all the facts he comes to the definite and final conclusion that they are genuine and did come from the great Emperor.

The evidence against the authenticity of the specimens is the official report of the autopsy which states death was due to cancer of the stomach and that with the exception of the liver, which suffered from adhesions, no other viscus was abnormal. In addition it is recorded that the autopsy was performed by Napoleon's physician, Dr. Antommarchi, in the presence of some dozen medical and lay observers, and that after the examination all the viscera, except the heart and stomach, were returned to the body which was then sewn up and guarded. It is denied that any opportunity occurred for the intestines to be extracted, though it is probable that the observers did not stay until the body was sewn up.

PLATE 14

Portions of intestine showing inflamed Peyer's patches said to belong to Napoleon. The specimens passed to the Royal College of Surgeons on Astley Cooper's death. Unfortunately they were destroyed when the College was heavily damaged in an air raid in May 1941.

As Keith explains, the official report was a mere political document in which the finding of a cancer of the stomach was seized upon and stressed as the cause of death and no other observation was allowed that might support the accusation put forward by the opponents of the Government of the day, that Napoleon's death was due to a tropical disease contracted as a result of his incarceration in St. Helena. Barry O'Meara, who appears to have been genuinely attached to the Emperor, had been sent home and dismissed from the navy three years earlier for daring to say that the relapsing fever suffered by Napoleon was a tropical illness. It is denied that he could have secured the specimens to give to Astley Cooper since he was in London at the time of Napoleon's death.

In Antommarchi's own account of the post-mortem (and he was a trained pathologist) we read:

> The digestive canal was distended by a great quantity of gas. In the peritoneal surface and in the folds of peritoneum (mesentery) I observed small spots and patches of a pale red colour of various dimensions and scattered at some distance from each other.

There appears to be no definite reason why Antommarchi should not have been able to secure part of the intestines, especially as he must have been very anxious to obtain evidence as to the cause of Napoleon's chronic relapsing illness. As Keith says:

> Centuries of a struggle to elucidate the problems of human disease against the obstacles raised by prejudice on the part of the public at large have compelled the best medical men to carry out the behests of science and human well-being by underhand and crafty means. I have known cases where great parts of the body were removed under the most strict surveillance. Antommarchi was an expert at annexation; he stole and smuggled out of St. Helena the fine death mask of Napoleon.

Three months later Antommarchi was in London and must have visited Barry O'Meara who was living there at the time; two years before, when Antommarchi was on his way to St. Helena, he had spent three months in London and had seen and talked to O'Meara about Napoleon's illness and treatment nearly every day. It is inconceivable that the two men did not meet on this occasion and it is natural that O'Meara should have been glad to accept the specimens of intestine showing the chronic lymphoid hyperplasia and inflammation, not only as an addition to his other Napoleonic relics, but also as some justification for his own diagnosis of the cause of the Emperor's relapsing illness. We have Astley Cooper's own written note that he received the specimens from Barry O'Meara direct. Keith says:

> My faith that these specimens might prove genuine rested on my belief in Sir Astley Cooper. He had John Hunter's passion for collecting specimens, especially such as illustrated diseases of distinguished patients. . . . There can be no doubt that the two specimens were in the possession of Astley Cooper, and that he believed they were genuine and, we may be certain, had good reason for this belief. He was the trusted medical adviser of Lord Liverpool, the Tory Prime Minister during the exile, illness and death of Napoleon; he was well acquainted with Lord Bathurst, Secretary for War and for the Colonies, who had the care and keeping of Napoleon. He must have been consulted often by these two men about the Emperor's case. If anyone in England could possibly command or obtain any first-hand evidence from the post-mortem examination Sir Astley Cooper was that man. We know, too, he was an alert man of the world—a shrewd judge of men, and the very last person to deceive himself or wilfully to mislead others when in the quest of truth. Hence when he attached the brief label to the Napoleonic relics we may be certain that he knew how O'Meara obtained them. He pronounced them to be cancerous growths, the very diagnosis that O'Meara would not have wished diagnosed. Now, long years after, when all the actors are dead and gone, these specimens are submitted to modern and accurate methods and they prove to be not cancer but diseased lymphoid patches, probably manifestations of the infection of the body by one of those diseases which are still endemic to tropical or semi-tropical countries—a diagnosis which ought to give the disturbed ghosts of O'Meara and Antommarchi nights of blissful rest.

The specimens in this jar were, unfortunately, amongst the many destroyed when the Royal College of Surgeons was heavily bombed and set on fire in May 1941. They appear, however, to be shown in the portrait of Erasmus Wilson that hangs in the Council Room of the College. It is, perhaps, worthy of note that the armed forces of the dictator of Germany should have destroyed this relic of the former dictator of France.

CHAPTER XVI

RETIREMENT FROM HOSPITAL WORK; THE FOUNDING OF GUY'S HOSPITAL MEDICAL SCHOOL

MANY of Sir Astley Cooper's activities during the height of his career have been necessarily dealt with in the preceding chapters, but we must once more take up the chronological thread of his life from the time when he was made a baronet in 1820. Many honours and distinctions now came to him. In 1822 he was elected to the court of examiners of the Royal College of Surgeons. This was an appointment which pleased him greatly and one that he took seriously; he felt that it carried a great responsibility both to the candidates and to the public. According to Bransby Cooper he was a careful, kind and considerate examiner and conducted his examination in a simple straightforward manner.

Later, when he was President and had to inform candidates of their rejection he often took a great personal interest, even going so far on occasions as to write to the parents of a failed student, explaining the reasons for the failure and encouraging them that a little more study should be all that was necessary for a pass. This action would seem to be characteristic of the serious and thorough manner in which he applied himself to any task, and also of the kindliness of his nature.

His address to successful candidates when admitting them as members of the College is interesting as it certainly reflects what he considered to be the basis of his own success; doubtless it often passed over the heads of the relieved and exultant examinees!

> ". . . And now, gentlemen, give me leave to tell you on what your success in life will depend.
>
> First, upon a good and constantly increasing knowledge of your profession.
>
> Secondly in an industrious discharge of its duties.
>
> Thirdly upon the preservation of your moral character.
>
> Unless you possess first KNOWLEDGE, you ought not to succeed, and no honest man can wish you success.

> Without the second, INDUSTRY, no one will ever succeed.
>
> And unless you preserve your MORAL CHARACTER, even if it were possible you could succeed, it would be impossible you could be happy."

In 1825 events took place which were not only of outstanding importance to him, but were to lead to far-reaching results.

In the chapter dealing with his work as a lecturer it was mentioned that the deterioration of his health caused him to resign his post as lecturer in anatomy and surgery to the United Hospitals. Difficulties had been arising between the staffs of the two hospitals for some time and matters now came to a head. It had been the custom for a lecturer, although holding his appointment from the Governors of the Hospital, to be able to nominate his successor. Cooper himself was nominated by Cline. During the last months of his lectureship, while he had been unwell, Aston Key had been giving the surgical lectures, and Bransby Cooper the lectures on anatomy. It was Sir Astley Cooper's intention that these two should continue in the lectureships, and it was understood that on his resignation they would be officially appointed by the Governors of St. Thomas's Hospital, in whom the authority lay. In January 1825 he sent his resignation to the Governors of St. Thomas's who accepted it and straightway appointed South of St. Thomas's as lecturer in anatomy. Sir Astley Cooper was astonished by this action and asked the Committee to reconsider their decision but was met with a blank refusal. It is clear that the Governors were right in acting as they thought fit, but at the same time it is easy to understand Sir Astley Cooper's feelings in the matter. He had been lecturer for over thirty years and by his ability had attracted large numbers of students and brought much fame and benefit to the United Hospitals; it was not unreasonable for him to expect that his wishes in the appointment of his successors would be respected, especially as it had been the recognised custom for the retiring lecturer to nominate the new holder of the post.

In the library of the Royal College of Surgeons is preserved a manuscript copy of a letter written by a body of students at St. Thomas's Hospital to the Treasurer, protesting vigorously against the appointment of South in Sir Astley Cooper's place. It is clear that the Governors' action was far from popular with the students.

Bickering and quarrelling now arose between the staffs of the two hospitals, accompanied by accusations which were scarcely creditable to the principle actors. There can be no doubt that much of the trouble arose from a certain feeling of jealousy on the part of the St. Thomas's staff that the upstart hospital of Thomas Guy had reached greater eminence and at the expense of St. Thomas's. Even Henry Cline had been affected by this and he and Cooper became estranged as a result of it. Cooper wrote:

> he was excessively jealous of Guy's Hospital. "We never heard of Guy's Hospital till lately", he said, "it sprung out of St. Thomas's only."

There could be only one satisfactory way out of the situation, and the necessary step, that of forming a separate Medical School of Guy's Hospital, was at once taken up by Mr. Harrison, the Treasurer of Guy's. In this he had the active and vigorous support of Astley Cooper, and again we find ourselves faced with yet another result of the influence of Astley Cooper's ability and personality. His prestige had brought great success to the two hospitals; the situation that had arisen was intolerable and it was natural and inevitable that he should press for the establishment of a separate medical school. Again there can be no doubt that he was absolutely right in this, and the generations of Guy's men since his time should know that the part he played in the founding of their school is yet another of the big debts which they owe to him.

Due credit must also be given to the Treasurer for his ready appreciation of the situation and the promptness and efficiency with which he acted. During the summer of 1825 the necessary buildings and a lecture theatre were built, and by October 1825, when the academic year started, they were ready to receive students. Aston Key and Bransby Cooper were appointed to the chairs of surgery and anatomy respectively.

The new Medical School of Guy's Hospital now gained from the great prestige of Astley Cooper, which had already done so much for St. Thomas's. The entry of students was large and most of those who had been at St. Thomas's came to Guy's. Bereft of the attraction of Sir Astley Cooper's teaching and having no one on the staff of any great calibre, the St. Thomas's Medical School began to decline. This decline continued in spite of many efforts to correct it, and it was not until the hospital moved to the embankment in 1871 that the medical school revived.

The year 1825, in which the medical school was founded, was also the centenary of the foundation of Guy's Hospital. As the nineteenth century wore on, the lustre that had been imparted to the new school by the great surgeon who had so much to do with its foundation was in no way dimmed. The brilliant succession of clinical teachers in the staff of the hospital, many of whom have names imperishable in the history of medicine, pathology and surgery, raised the school to an eminence second to none in the world.

After this eulogy it is necessary to consider a less attractive side of medical custom at the time, which helped to fashion the events just described. Astley Cooper has been assessed as the prince of many things; unfortunately he was also accused of being the prince of nepotism.

Thomas Wakley, founder of the *Lancet*, to whom we have already referred in connection with the publication of Cooper's lectures, was an agitator and medical reformer. One of the abuses he set himself to correct was the favouritism and nepotism which he said determined most of the staff appointments at the London hospitals, and often led to the exclusion of good men and the selection of incompetent ones. The path to the staff in those days was usually by way of an apprenticeship. The man who served as an apprentice to a surgeon on the staff of a big hospital was considered to be training as a hospital surgeon. It was inevitable that a surgeon of Sir Astley Cooper's position should attract good apprentices, and it is equally inevitable that their recommendations for a staff appointment were considerable. In any country, even to-day, the assistants trained by a great surgeon will usually be found in important positions. Thus most of the surgical staff of St. Thomas's and of Guy's had been associates of Astley Cooper and some of them were even related to him. His own appointment to succeed his uncle William Cooper was gained purely on merit, but the same could not be said of the appointment of his nephew, Bransby Cooper, to succeed him. In fact Wakley made the direct accusation that Bransby Cooper owed his appointment entirely to his relationship to his uncle and not at all to his ability as a surgeon, and that a better surgeon had even been passed over when the appointment was made.

Astley Cooper somewhat ingenuously exposed himself to an attack on an occasion when he replied to accusations that he was maligning members of the surgical staff of the Borough Hospitals, by saying: "Who are the men against whom it has been supposed that these observations were directed? Are they men whom I could possibly feel disposed to injure? Mr. Travers was my apprentice, Mr. Green is my godson, Mr. Tyrrell is my nephew, Mr. Key is my nephew, Mr. Morgan was my apprentice."

To this naïve confession Wakley replied that he was convinced it was impossible that Sir Astley Cooper should be actuated by other than friendly feelings towards such a family party:

> a party, united to each other, not only by the amiable ties of consanguinity, but by the no less delightful *vinculum* of a common participation in £3,600 which they annually extract from the students.

Wakley, by order of the surgeons, was at once excluded from attendance at St. Thomas's Hospital, a privilege which he had enjoyed as being a former student. The relations between the *Lancet* and the London hospital officials, already strained, now became bitter and hostile and remained so for some ten years.

The procession of close associates or relatives at the United Hospitals was even longer than the above group shows. Thus Henry Cline was succeeded by his son in the joint lectureship with Astley Cooper, and when Henry Cline, junior, died in 1820 he was succeeded by a cousin, Joseph Green. The post of demonstrator of anatomy from which Green was promoted was then filled by Aston Key, who had been Cooper's apprentice and had "wisely married a niece of Astley Cooper". Aston Key was appointed assistant surgeon to Guy's in 1821, a post specially created for him. Morgan, another apprentice of Astley Cooper, was appointed assistant surgeon at the same time. In 1826 both were promoted to full surgeon.

Aston Key married a sister of Bransby Cooper, who was a nephew of Astley Cooper and also his apprentice; his appointment to the staff of Guy's on his uncle's retirement has been mentioned. Edward Cock was also a nephew of Astley Cooper.

Although these family interconnections are so involved as to be almost Gilbertian, before passing too harsh judgment it should be remembered that the appointments were influenced by a process that was the general custom in London at that time. It would be incorrect and unfair to judge entirely by the standards of to-day when the apprenticeship system no longer exists. It should also be remembered that, although it is possible that equally good or even better men might have been found to fill the posts if the appointments had been thrown completely open, the men who were appointed were all good and competent surgeons and teachers, and certain of them were men of eminence. Aston Key, notably, was a brilliant surgeon who would have graced any hospital staff.

Wakley lost no opportunity to raise a quarrel and his baiting of Tyrrell, which ended in an unfortunate lawsuit, was mentioned in discussing the publication of Cooper's lectures. His bitterest attack, however, was directed against Bransby Cooper; an amiable man but no more than an average surgeon. In 1828 Wakley published an article in which he accused Bransby Cooper of gross malpraxis and incompetence in taking an hour to perform an unsuccessful lithotomy on a man who succumbed to the operation. He described Bransby Cooper as "one of the privileged order—a hospital surgeon—nephew and surgeon, and surgeon because he is a nephew". This black and harsh libel could not be passed over and Bransby Cooper was obliged to defend his honour in the courts. The libel action that followed has become notorious and this is no place to enlarge upon the details. Those who are unfamiliar with them should consult Sprigge's *Life of Wakley*, or the excellent account by Sir Herbert Eason in the *Guy's Hospital Gazette* for 1932. Amongst the many distinguished surgeons who gave evidence on Bransby Cooper's behalf was Astley Cooper. Bransby Cooper won the action but the experience must have meant much anguish and suffering for him and must have marred his life for many years. Whatever substratum of right Wakley may have had in his crusade, nothing could have justified such an attack, and even Sprigge, an admirer of Wakley, refers to "this sad and even terrible passage in Wakley's life". Sprigge also says that the one pleasant thing to relate about it is that in after years a formal reconciliation took place between Wakley and Bransby Cooper.

The ill-health that compelled Sir Astley Cooper to resign his lectureship also caused him to resign his position as senior surgeon to Guy's Hospital and, soon after the separation of the two schools, he was appointed consulting surgeon. He was now fifty-seven years old and devoted himself "chiefly to the science of my profession, excepting a few hours in the middle of the day". In other words, instead of accepting this new-found freedom from the hospital ties of thirty years as an opportunity for relaxation and pleasure, he at once began to use it for advancing himself even further in his search for new knowledge. Doubtless during his busy years he had put aside doing many things until such a day as this. The fruits of these years have been detailed in the account of his publications.

Although he had retired from hospital work, he continued almost as busy as ever in private practice, and at this time was attending many of the most distinguished men and women in the land.

The year 1827 was a sad and momentous one for him. Lady Cooper, since the death of her adopted daughter, had been living entirely at Gadesbridge. Astley Cooper, owing to his increasing ill-health, had been paying more frequent and longer visits there, and during one of his prolonged stays Lady Cooper fell ill with erysipelas of the head and died. Her death was a terrible blow to him, and his grief caused a great depression. Although they had been so much separated during his busy professional life, their affection for one another was deep. Unfortunately only the barest details of their domestic life together are given in Bransby Cooper's biography, and it is not possible to enlarge upon it.

After some weeks Sir Astley Cooper returned to London and tried to do part of his practice again, but found that the recent event had upset him and his health was so poor that he could not apply himself properly to his work. On an impulse in this depressed and miserable state he made up his mind to retire from practice altogether, and in September 1827, at the age of fifty-nine, he gave up work in London intending to spend the rest of his life on his country estate.

For a short time he enjoyed the change and his health rapidly improved, but in less than six months the new life had begun to lose its charm and he became so oppressed with boredom that he decided to start practice once more. He returned to London as suddenly as he had left it, took a house, and in a short time was as busy as ever in practice.

In this same year, 1827, his leadership of English surgery was acknowledged by his election as President of the Royal College of Surgeons. In 1836 he was elected President for a second term of office.

In 1830 yet another great honour came to him, and one rarely accorded to a surgeon. He was already a member of the Royal Society but he was now elected to be one of its Vice-Presidents.

The year after the death of his first wife he married again; this time the sister of an old friend. The marriage took place in July 1828 when he was just sixty. We know even less of this marriage than of his first one, for in Bransby Cooper's biography no further details of any importance are given, nor is there a description of the new Lady Cooper; probably because she was still living at the time the biography was written.

We do know that she accompanied her husband on two tours on the Continent, the first of which was in the summer of 1830. He spent five weeks visiting northern France, Belgium, Holland and Germany, and everywhere he went made a point of seeing the work at the local hospitals and medical schools and of inspecting their museums. In many places he met old students who had attended his classes in London. In 1834 he again visited Belgium and Germany, then Switzerland and back through France to Paris where he spent two weeks. Bransby Cooper says that apart from a few days in 1802 this was his first visit since the memorable stay on his delayed honeymoon in 1792, but this is incorrect as in the second edition of his book on hernia he refers to "M. Dupuytren, to whom I feel greatly indebted for various acts of kindness and much information when I visited Paris in 1825". It is interesting that in 1802 he saw Napoleon Bonaparte reviewing the troops who had fought at Marengo; in the evening he saw him with the Empress Josephine at the opera. On this same visit in 1802 he also met Prince Louis Bonaparte at dinner.

The Continental visit in 1834 was, again, not devoted solely to pleasure. Whatever place he visited on his long journey he lost no opportunity to study the surgery there and to go intently through the museum. In Paris he even settled down to some human dissection as he had a problem that he wished to investigate. He called upon Dupuytren and found him very ill with pneumonia; the French surgeon agreed, however, to provide him with material for dissection. On the next day the note in Sir Astley's diary reads:

> *Oct. 6th.* Rose at six, and went with Dr. Marx to see the provision Dupuytren had made for my dissecting. We went to the Hotel Dieu,

> and I found a room devoted entirely to myself, a cadaver there etc. I dissected for nearly two hours before breakfast, and afterwards for four hours between ten and two o'clock.

Everywhere he went in Paris he was received with honour, from surgical colleagues and lay friends alike. We read of his meeting with Lisfranc and Gay-Lussac.

> I then went to the Soirée de l'Institut, and this I feel to be one of the proudest days of my life, being in a foreign country, among strangers, and received with so much honour.

He was not impressed with the surgery that he saw for he says:

> The surgery of France is that of fifty years ago, but it is every day improving. They are not good physiologists, and therefore, although they have anatomy and practice, they have no principles. Their physic is quite hypothetical in principle and feeble in practice.

Two years earlier, in 1832, he had received three great distinctions from France. He was elected a member of the Institute of France and also a member of the French Academy of Sciences. From the king, Louis Phillippe, he received the rank of officer of the Royal Order of the Legion of Honour.

In 1834 he was given an honorary degree of Doctor of Civil Laws by Oxford University, and in the following year was made an Honorary Fellow of the Royal College of Surgeons of Edinburgh. On a later visit to Edinburgh the honorary degree of LL.D. was conferred upon him by the University. It would, however, be tedious to enumerate the long list of honours, decorations and honorary degrees conferred upon him. It is sufficient to say that his prowess brought recognition of this sort from almost every civilised country in the world.

CHAPTER XVII

RECREATIONS AND AMUSEMENTS

TO complete his portrait it is necessary to know what a man does for recreation in his spare time as well as what he does in his working hours. Astley Cooper's busy life left but little time for recreation, and certainly the ordinary daily routine left next to nothing, but he still contrived on week-ends and holidays to enjoy himself almost as heartily as he worked.

During his most active years of practice he had but few extra-professional contacts, for although he belonged to several clubs they were nearly all connected with medicine, and when he left his practice in the evening it was usually to go to one of these or to a medical conversazione at a friend's house.

In the busy years at Broad Street he gave regular parties at his house and made it a rule at least once or twice a week to invite doctor acquaintances to dinner. The parties were given to general practitioners and consulting physicians whom he met in his work, and his dressers and some pupils were also invited. His wife apparently took no part in these parties, as she usually either went into the country or spent the evening with a friend. At the beginning of the academic year he arranged special parties for his old dressers and students. Even these evenings would often be interrupted by the demands of his practice, and after dinner he would sometimes leave one of his apprentices to act as host. Just as often he would slip out and hide himself in his dissecting-room for the rest of the evening!

In addition to the purely medical societies he belonged to two clubs. The Pow-Wow Club seems to have been in the nature of a medical dining club which met once a month; it was started by John Hunter. Astley Cooper attended its meetings for many years until it was dissolved in 1830, and when he was made a baronet gave it a special dinner in celebration.

The other club, the Athletae, as its name implies was chiefly a sporting club, and though its members were mostly the shining lights of medicine and surgery, its membership was not restricted to them so that other contacts were obtained. Dr. Babington was apparently its keenest member and was a good all-round athlete. At Lettsom's house the club met to play quoits and bowls, but when Babington took a house in Tottenham a large barn was converted into a fives court and gymnasium where single-stick, wrestling, fencing and boxing went on. Astley Cooper was an active member of this club, and as he was himself a good shot, was particularly fond of the shooting matches.

During the winter the Athletae changed into a dining club and met once a month at the different members' houses. It was a club which appealed to the original members only, for as they grew too old to continue the more vigorous activities it degenerated into a chess club and finally died a natural death with the disappearance of its members. For many years, however, it gave Astley Cooper relaxation and some exercise. He was a very "clubbable" man and was just as enthusiastic and irrepressible in enjoying himself as he was in his work. He was an entertaining companion and an attractive conversationalist. Although he was fond of dining out he was an abstemious man and rarely had more than a little wine. Two glasses of port, quickly drunk, were his usual indulgence.

For his annual holidays he often went abroad as he could not endure a conventional holiday in England; needless to say on his holidays abroad he lost no opportunity of seeing what surgery there was to be seen. In September he usually made it a rule to go shooting and before he had his own country estate at Gadesbridge went to Norfolk and stayed with his brother, Samuel Lovick, for a week or ten days. His friend, Coleman, the veterinary surgeon, and his wife's brother usually completed the party. Even here he would start the day by seeing and treating a few of the local poorer inhabitants who came to consult him when they knew he was there. On the visits to Norfolk he would also spend a few days wandering about in the district and places he knew as a boy.

At Gadesbridge he had his own shooting parties every autumn, the guests being usually professional friends. He would get up at his usual time, six o'clock, and until breakfast would ride round inspecting his farm. Although he was a good shot, the shooting was not very serious and often degenerated into just a noisy party. He himself could resist no chance of collateral scientific inquiry and would often stop to examine a bird that had behaved queerly when hit, in order to find the cause. If examination on the spot was insufficient he would take it home to the dissecting-room that he had at Gadesbridge. He even used his setters for experiments.

For many years Gadesbridge was the main scene of his relaxations and escape from professional life, in spite of the patients who would every now and then contrive to follow him even there. When his health began to fail in 1825 his visits became longer and more frequent and he also became more deeply interested in his farm. Like so many other medical men, both then and now, he contrived to lose a great deal of money as a result of his farming ventures. He decided to settle down to systematic farming work and arranged to spend three days every week on it while the other three were spent in practice in London. It was not an economic arrangement as he soon found out. His interest in the problem was just as intense as in his professional matters, and if he had a farmer for a patient would keep him talking for an hour or so while he asked him a string of questions about crops and horses, etc. His vexation at the failure of his farming is rather humorous, and an admonitory letter to his bailiff is worth quoting.

> ROBERT,
>
> Remember, it is no use giving more money for lean sheep than they will fetch when they are fat.
>
> Remember, it is foolish to mend an old gate with wood worth twice as much as the gate itself.
>
> Remember, it is foolish to sell wheat at market for less than it cost you to grow it, unless there is a real necessity for making the loss.
>
> Remember, it is no use having new wheels put to a waggon, when the body of the waggon itself will not last a month, etc., etc.
>
> Unless, therefore, you can show me that my views on these matters are wrong, or otherwise unless you will follow them, I think you had better give up farming for me, or I shall be obliged to give up farming myself for the want of means to go on with it.
>
> ASTLEY COOPER.

It is typical of his ingenuity and sagacity that he soon thought of a way to recoup himself for his losses. He had excellent pastureland but the price of lean stock was very high; he found that many lame and crippled horses were sold at Smithfield cheaply and he began to buy any young horses that might be of use as carriage or saddle-horses if it were not for their defect. He paid no more than seven pounds each and usually about five pounds. They were then sent to his farm in the country where they were put to pasture; often between thirty and forty would be collected there. In the winter, the production of manure from the straw-yard was alone a valuable return, but his real object was in curing them of their disability and thus converting them into saleable animals on which he could make a good profit. He naturally also obtained much pleasure from this and proved an able veterinary surgeon, dealing with the horses' ailments himself. Many of them improved rapidly even with being allowed to run at pasture and would afterwards be sold for fifty guineas or more. Astley Cooper himself had his own carriage drawn for years by a pair of horses for which he paid only twelve pounds and ten shillings and was very proud of them.

If the defects proved incurable and the horse continued lame, then it would be slaughtered at very little loss. Others of the larger clumsier ones, not suitable for carriage work, were used on the farm and gave a good return on the original outlay. The farming venture went on for some time as a profitable business but eventually he gave it up.

At another time he planted a furze-field on his estate as a haunt for foxes as he wished to encourage the Hertfordshire hounds. Although he was a subscriber to the hunt he rarely hunted himself; he would sometimes ride to the meet but did not like the dangers of the cross-country ride.

Even in the country he could not be separated from dissecting and had a special room for this purpose at his house and would often spend many hours in it. In the later years some of his finest specimens were prepared there.

Similarly while on holiday away from Gadesbridge he would neglect no opportunity of adding to his knowledge; for instance when staying at Cromer his chief occupation was dissecting fish on the seashore. His diary on this occasion speaks for itself.

Sunday, Sept. 25th: Rose early and dissected eels, went to church.

26th: Rose early; rode on horseback along the beach and saw a boat with 1,400 herrings come in. Picked up three dog-fish and examined them; they are beautifully clean animals.

27th: Rose early and rode before breakfast. Dissected a gurnet, etc.

28th: Before breakfast walked on the beach and dissected dog-fish and herrings' brains.

29th: It rained but I went to the beach for a little time before breakfast. They brought me a porpoise, which I was sorry I did not buy, but I sent the heart to King at Guy's Hospital and dissected dog-fish.

Apparently he could not bear to stop in one place for long and after a few days would become restive and complain of boredom. If he was in England he would start thinking of his museum and would creep quietly back to London by himself, just leaving a note to say he did not want to break up the party. This was in later years when it seems that he was quite incapable of any sustained interest or enjoyment of places or things outside his professional work.

Another light on his character is given by his fondness of hard and fast driving. He would travel by coach from Gadesbridge to London in two hours and a half, urging his post-boys to drive as fast as they could; he was quite without fear in the matter and his journey on Monday morning was well known on that road. If he considered he was not being driven fast enough he would put his head out of the window and say: "My boy, I always pay threepence a mile for bad travelling, fourpence a mile for good, but sixpence a mile when you drive like the devil."

There is a story that during his brief retirement after the death of his first wife he was paying a visit to Brighton, and wandering on to the jetty he was so morose at his inactivity that he even contemplated jumping into the sea. Instead, he made the decision to return to practice and work in London, which he did at once, not relinquishing them again before his death. The only real breaks that he had from his work in those later years were the long continental tours and several long tours that he made in England and Scotland.

CHAPTER XVIII

JOHN HUNTER AND ASTLEY COOPER

Of the many advantages that came to Astley Cooper from his early association with Cline probably none was so important as his introduction to the principles and teaching of John Hunter. No one who has studied Cooper's life and work can fail to be impressed with Hunter's great influence on him. He was largely inspired by Hunter and in many ways sought to emulate him.

Henry Cline went to Hunter's first course of lectures when he had just finished his apprenticeship and at once realised their value and importance; he became a frequent attendant and knew Hunter well. He wrote:

> Having heard Mr. Hunter's lectures on the subject of disease, I found them so far superior to everything I had conceived or heard before, that there seemed no comparison between the great mind of the man who delivered them and all who had gone before him.

Fortunate indeed was it for Astley Cooper that Cline appreciated Hunter's worth and urged his young apprentice to go and hear him. Few other surgical teachers of the day would have done the same, and in fact most openly derided him.

It may be said that Cooper was lucky to begin his surgical training at the time of the Hunterian era so that he could be inspired by it. This is not entirely true because it was due to his innate good sense and ability to appreciate true worth that he recognised at once the indispensable need for following Hunter's methods and modelling his life-work upon them. A lesser man would have passed them over, as indeed so many did. He himself wrote:

> Although Mr. Hunter and his opinions were so much esteemed after his death, yet I remember that the surgeons and physicians of his day thought him a most imaginative speculator, and, anyone who believed in him a blockhead, and a black sheep in the profession. I have heard surgeons say: "What do you mean by *action*, and all such nonsense?" and men, too, who now extol him to the skies. At this day there are but few of his principles, which men of real science do not swallow with avidity.

Mention has already been made of many points of similarity between the lives of these two men. Hunter's early education was badly neglected; Cooper's was deficient through his own disinclination to serious study. Both led a wild life in their boyhood and both, on coming to London, launched out into reckless pleasure, although Astley Cooper's more refined upbringing did not lead him to the coarse debauches indulged in by Hunter. After a few months good sense prevailed and both became attracted by the study of anatomy. For both then followed a life of prolonged and concentrated industry in observation, dissection, research and teaching. There can be no doubt that Cooper was so inspired by Hunter that he followed even the details of much of his mode of working. But they completely diverged in their attitude towards what is, after all, the true reason for the existence of surgery, the care and treatment of patients.

Astley Cooper began to attend Hunter's lectures early in his apprenticeship and, in spite of Hunter's poor delivery and use of obscure language, was most attentive. The full proof that he appreciated their worth lies in his continued attendance over many years. He, like many other intelligent young men, went year by year to the course as the lectures were not repetitions but were constantly being added to and modified in the light of the fresh knowledge and facts obtained by Hunter's studies and experiments. Hunter himself refused to publish his lectures because of this constant modification that he found necessary; he felt that he had still so much to learn. In Palmer's *Life of Hunter* there is a story that Astley Cooper asked with surprise whether he had not the year before stated an opinion on some point directly opposite to the one he had just put forward. Hunter replied: "Very likely I did, I hope I grow wiser every year." Astley Cooper must have had many opportunities of personal contact and discussion with Hunter after his lectures; he knew him sufficiently well to assist him with the dissection of a whale.

> I went with him to the dissection of a whale, and he examined every part for himself, caring nothing about dirt or trouble, and taking out parts of the animal for minute subsequent examination.

He also attended regularly at the meetings held by Hunter in Windmill Street and was a prominent participator in the scientific discussions.

In his meetings and lectures he constantly refers to Hunter and the excellence of his work. His own industry and long hours of study must have been modelled on Hunter's as the resemblance is so close. His ability and determination to sustain the constant study and hard work while conducting a large private practice were entirely due to his own strength of character and earnest ambition. He tells us:

> Mr. Hunter was *a man who thought for himself*, but he was more; he was the most *industrious* man that ever lived. He worked from six in the morning till twelve o'clock at night and sometimes later. He would stand over the most minute object for three or four hours before breakfast, dissecting and exploring it. His vast museum is a proof of what industry can accomplish for it contains matter for seven years' investigation. He worked at each thing for himself, although he might have heard about it by his brother's lectures, or by men who read for him.

Astley Cooper followed almost exactly these long hours of hard personal study from early morning till late at night.

In his introductory surgical lecture he says:

> Physiological knowledge is of the utmost importance to the profession of surgery. This was the rock on which Hunter stood, admired by the wise, and abused by the ignorant; indefatigable in his research, he omitted no opportunity of exploring false theories, and substituting true ones founded on facts established by experiments. But it is said that he was a man of great genius. I do not think so; or if he were he owed it to his uncommon industry and assiduity. He was the last in the laboratory at night, and first there in the morning, allowing himself very little time for repose.

In spite of this solemn and considered statement, in a lecture on the treatment of aneurysm in which he is discussing proximal ligation, he says:

> It is to the transcendent talents of that immortal genius, Mr. John Hunter, that we are indebted for the great improvement which has taken place in this branch of surgery.

This raises the difficult question of what constitutes genius. Charters Symonds writes of Astley Cooper: "He was certainly no genius", and others have said the same. Here we have Cooper himself saying the same thing of John Hunter. If the well-worn tag be accepted that genius is an infinite capacity for taking pains, then there is no question about the answer in the case of both men. This attribute is, however, but one quality of genius and probably indispensable for sustained success rather than transient achievement. The definition is most difficult, but one supposes that the man of genius contributes something special by his labours, something far above the average in quality and, in particular, something that reveals a new truth and is enduring. There can be no doubt that Hunter can fairly be described as a genius; his new interpretation and recognition of the science of surgery was fundamental and has lasted and will continue to last beyond him. Did Astley Cooper, by his work, achieve anything of the same high calibre? Hardly so, for his work was not of the high original order of Hunter's; it could not well be so as he was following where Hunter had led. Nevertheless there are grades of genius as of other qualities.

His work survives to-day, over one hundred years after his death, and still remains as an inspiration to us. The reason is easy to see; it is due to the example of the great clinician and great practical surgeon basing his knowledge and practice on what he has taught himself by constant and unremitting observation and experiment. Even the distractions of a huge and successful practice and of an exacting professorship did not deter him from his continued search for new knowledge by dissection and experiment. His recognition of the importance of this, his determined pursuit of it and the example he thus set to a host of other surgeons is wherein his genius lay. He was the great surgeon, successful not only in his science but in his healing.

In this respect he and Hunter diverged completely, and Hunter was lacking in Astley Cooper's surgical ability; he was not a successful practitioner of surgery although he had a huge practice. Unfortunately the successful and skilful treatment of patients, the very be-all of our existence as doctors, does not weigh in the scales of general opinion so heavily as pure scientific achievement. This great quality which Astley Cooper possessed detracts, therefore, in the eyes of many, from his attributes as a man of true genius.

. Let us hear what he says himself of the relationship between surgery and research. In his *Surgical Essays*, published with Travers in 1818, we read:

> Young medical men find it so much easier a task to speculate than to observe, that they are too apt to be pleased with some sweeping theory,

> which saves them the trouble of observing the processes of nature; and they have afterwards, when they embark on their professional practice, not only everything still to learn, but also to abandon those false impressions which hypothesis is sure to create. Nothing is known in our profession by guess, and I do not believe, that, from the first dawn of medical science to the present moment, a single correct idea has ever emanated from conjecture alone. It is right, therefore, that those who are studying their profession, should be aware that there is no short road to knowledge; that observations on the diseased living, examinations of the dead, and experiments upon living animals, are the only sources of true knowledge, and that deductions from these are the sole basis of legitimate theory.

In his introductory surgical lecture he says, more concisely:

> In surgical science, hypothesis should be entirely discarded, and sound theory, derived from actual observation and experience, alone encouraged. The first is an *ignis fatuus*, which is sure to mislead; the last a polar star, a never-failing guide.

This is a profound observation and one that deserves careful meditation. It is the creed of his practice of the art and science of surgery; the basis of his success as a great surgical leader.

As a successful practical surgeon he dwarfs Hunter completely. He attributes Hunter's failure in this respect to his inability to recognise the fundamental truth of this creed enunciated above. Thus:

> His theories were excellent; his practice not very good; for all his treatment of disease was much his own, and not confirmed by experience. It was founded upon theory, instead of his theories upon his practice. He was singular in his manners and his opinions, and often exhibited the simplicity of a child in the remedies he prescribed.
>
> A person had a swelling in his legs, and consulted him, and he said: "I know nothing better than cabbage leaves, which I have heard produce great perspiration, and they will sweat your legs down."
>
> Mr. Howden had a patient with an obstinate running sore, and he said: "We will consult Mr. Hunter about your case." As they walked from the city to Mr. Hunter's, the patient said to his medical attendant: "What must I give Mr. Hunter?" and he answered: "Two guineas to such a man." They went into Mr. Hunter's room, and the case was explained. Mr. Hunter folded his arms and said: "And so, sir, you have an obstinate running sore?" "Yes, sir." "Why then, sir," said Hunter, "if I had your running sore I should say, 'Mr. Sore, run and be ——.'"

That Hunter was so completely lacking in the elements of proper behaviour to a patient and so incapable of appreciating the merits of healing for healing's sake, in no wise detracts from his abilities as a scientific worker. That Astley Cooper was greatly blessed with the proper appreciation of the duties and attributes desired in a successful practical healer should likewise be no drawback to his acceptance as a surgical genius. His practice of surgery was based upon his recognition of the fundamental importance of observation and deduction and was supported by his lifelong industrious application to the principles which he taught and extolled.

Just as Astley Cooper gained so much from Hunter and was fortunate in that Hunter preceded him, so is Hunter fortunate that he was followed by a man of such calibre as a surgeon that he was able to take Hunter's principles and project them into successful practical surgery. Astley Cooper did this for fifty years, and when he died he had founded a method of surgery that is still alive to-day, since it is fundamentally correct. In this way the lives of these two great men are complementary. I will finish this chapter by quoting the closing words of Sir Charters Symonds's Hunterian oration delivered in 1921.

> The Hunterian era awoke in the minds of men a desire to explore the old ground by new methods, and so unearth the truth so long concealed. There was a spirit of adventure, like that which animated the Elizabethan explorers, the ambition of the healthy human intellect to extend its range of vision and knowledge.
>
> To Hunter belongs the credit of the discovery of this new world. He it was who lighted the torch, and I hope I have shown that Astley Cooper was amongst those who first carried it forward in the race, kept it alight, and then passed it on, not only undiminished, but burning with a mightier flame; and so when his course was run the goal was nearer for the part he had taken.
>
> *After brief life men die, and like runners in a race hand on their torch to another.*

CHAPTER XIX

THE MAN AND HIS PERSONALITY

THE presentation of Sir Astley Cooper's character and personality is largely contained in the foregoing chapters, but if this biography is to be complete it is necessary to summarise what we have been able to learn of him in a personal regard. This assessment is perhaps the most difficult of the tasks that befall a biographer, particularly when the man himself was of a generation long passed away. On the other hand the difficulty is offset by the greater detachment which the passage of time allows. Contemporary estimations must still be studied, whether for acceptance, modification or refutation.

As a man Astley Cooper had the great gift of a handsome, commanding and attractive figure and countenance. One glance at the picture which forms the frontispiece of this book is sufficient to confirm this, but in addition we have the accounts and appreciations of his friends, some of which have been quoted already. The striking portrait is an engraving by Samuel Cousins of the fine painting by Sir Thomas Lawrence which hangs in the Royal College of Surgeons. It is said to be the best of Lawrence's work and shows Astley Cooper in his prime, when he was the unquestioned leader of surgery in this country and perhaps in Europe. It was painted about 1814 at the request of his old students and admirers; he was then about forty-five years old. Although there are several other portraits of him this is said to be the only one that merits attention as showing the man as he was.

Benjamin Travers's description may well be recalled:

> Astley Cooper, when I first knew him, had decidedly the handsomest, that is, the most intelligent and finely formed countenance and person of any man I remember to have seen. There was a fine and quickly responsive animation in his eye, and though he was of full height, the outline of his frame was muscular and flowing, without an approach to corpulency. He was remarkably upright and moved with grace, vigour, and elasticity.

As he grew older and took less exercise his figure became stouter and his face plethoric. His easy good-humour and geniality remained, although he was liable, at times, to fly into a sharp fit of anger in which he would not hesitate to express his opinion forcefully to anyone, although if he felt afterwards he had been harsh or had hurt the feelings of whoever had crossed him he invariably repented and went out of his way to express contrition. He was definitely a kindly, considerate and gentle man whose anger or annoyance was shortlived; he bore no lasting resentment to anyone and throughout his long professional life, at a time when hard-speaking amounting almost to direct libel was common, he had but few quarrels or controversies, and none of a serious nature. The major incident of the break between the two schools of the United Hospitals, although it was associated with much rancour and ill-feeling, arose from circumstances of which he was only a part. It was inevitable that at times there should be criticisms and accusations from other surgeons of a man who had reached his pre-eminence, but none of these was serious and but few justified. So far as it is possible to tell, his associations with his colleagues were strictly honourable, and he was always fully appreciative of the works of others and never hesitated to give proper acknowledgement to them. Sir Charles Bell accused him of borrowing from his work on fractures of the neck of the femur, but Astley Cooper was himself greatly interested in this subject and did much research upon it; probably both men were working on similar lines.

His general reading was restricted and he made no effort to keep in touch with all that was written by others, rather relying upon his own observations and research. This is not to say that he ignored the work of others, for he was familiar with anything of value in them; this is shown in his own writings and lectures, for he constantly refers to the work of others and does not hesitate to give generous praise and appreciation. Moreover, the notes of many of the illustrative cases he quoted are from the practice or writings of other surgeons. He was an enthusiastic and regular attendant at society meetings and made full use of this contact with other surgeons and their selected cases. In his lectures he seems almost to go out of his way to praise the work, skill or judgement of one or other of his friends or contemporaries.

He was always anxious to see others work and to learn from them. His visit to Edinburgh probably introduced the value of this to him.

On his several visits to Paris he knew Larrey, Dubois, Desmaret, Chopart and Dupuytren. Larrey and Dupuytren came to Guy's to see him; Dubois was present at his first operation for ligation of the common carotid. On his continental tours he saw many surgeons in France, Germany, Belgium, Holland and Switzerland. In the *Guy's Hospital Gazette*, *1909*, is an amusing cartoon by R. W. Wingent of an episode which Astley Cooper found embarrassing when Dupuytren visited him. As the French surgeon took his leave he saluted Astley Cooper on both cheeks; Astley Cooper's discomfiture caused great amusement to a crowd of interested and closely attentive students!

He was universally popular in the profession, and by his unfailing courtesy and his charming and cordial manner made many friends; these must have numbered thousands throughout the country and besides sending many patients to him they supplied him with a steady stream of pathological specimens and notes of cases of interest. His generosity of mind is shown by the story of an incident when he was visiting Norwich Hospital in 1809. He was watching a local surgeon doing an operation for ligation of the femoral artery and, either through incompetence or confusion at Sir Astley Cooper's presence, the operator was fumbling about in hopeless indecision, being quite unable to find the vessel. Cooper appreciating his embarrassment leaned forwards and said: "Nothing could be better, sir; you have it there", and pushing aside a muscle indicated the artery. This was done in an easy tactful way that concealed the incompetence of the surgeon.

His wide popularity in the profession cannot be ignored in assessing his character, for it seems to have been an early and constant achievement. Not only was he popular but he was respected and admired, and it is obvious from contemporary writings and remarks that he was held in really great esteem. In addition to the excellence of his work and attainments this was due to the widespread appreciation of the fineness of his character. Four things in particular went to make this up; his truthfulness, his cheerfulness, his kindness and his industry.

He hated deceit, and the knowledge of this rectitude made his spoken and written work readily and widely accepted since it was also known that his utterances and recommendations were always based on his own observations and experiences. His moral character was high, and it is said that his love and respect for truth was so strong that if once he detected anyone deviating from it, he could never after be induced to place confidence in the man. His frankness of manner made him readily accessible to any who cared to approach him, and no student, except the lazy or shiftless, received anything but courteous and willing help from him. His cheerfulness spread to all around him and truly indicated his kindliness and good feeling towards his fellow men. His kindness to others is instanced in a hundred ways and is most seen in his attitude towards his patients, especially when the necessity for an operation arose. The horrible ordeal this entailed in the early nineteenth century needs no emphasis, and Astley Cooper went out of his way to smooth the path for the patient as much as possible. The confidence of his manner and the supreme confidence that his reputation gave, caused his advice invariably to be accepted, and the kind and encouraging way in which he presented it helped to steel the patient for the ordeal in front of him. His solicitude for his poor patients never wavered, and he always stressed the great importance of relaxing no attention or kindness to the humblest of men. If for nothing else, Sir Astley Cooper's soul should find peace for his great attribute of unfailing charity in this respect. His success in the highest ranks of practice might easily have caused him to pay less attention to his poorer patients, but this was never so.

A surgeon in those days must have needed a strong, hard nature not to be perturbed or distressed when operating on a conscious patient; Astley Cooper's firmness of manner and confidence in his surgical skill enabled him to be a successful operator but did not dull his feelings towards the sufferings of the patient. He was always carefully solicitous of those on whom he was operating. Although it is necessary for a surgeon to inflict pain or discomfort at times, and although his appreciation of this necessity enables him to reconcile himself to the unpleasantness of his task, it does not follow that he is undisturbed by it, unless he is of a hard, unfeeling type. Some of Astley Cooper's critics said that he liked operating for its own sake. He strenuously denied this and said that it was no less an ordeal for him than for other surgeons. South's words are convincing testimony in support, for he says that Astley Cooper's kindness and encouraging manner while operating was very striking and not exceeded by any operator he had ever seen. He tells the story heard from a Quaker friend of his whose grandchild was to have a naevus removed; when the child was brought into the room it smiled sweetly at Astley Cooper, and Cooper turned and burst into tears.

South also says:

> To his professional friends and acquaintances Astley Cooper was always most true and honest. He was at all times ready to advance their interests and encourage their honourable exertions.

These words from South are even more important when it is remembered that it was his appointment as lecturer in anatomy to St. Thomas's Hospital in place of Bransby Cooper that precipitated the separation of the two medical schools.

Enough has been said to show Astley Cooper's great industry, and he himself attributed much of his success to it. In the assessment of his own character found amongst his papers after his death he writes:

> For the benefit of the younger members of my profession let me say, that this success may be always accomplished in a great degree.
>
> Be kind to everyone, and most active to oblige.
>
> Learn your profession well, be an excellent anatomist, and understand well the practice and duties of your profession.
>
> Bend the force of your mind to some useful object, and be not multifarious or vacillating in your pursuits.
>
> Deep science is desirable to the man of fortune, useful science to the physician and surgeon.
>
> Let your zeal and industry be unbounded.
>
> My own success depended upon my zeal and industry; but for this I take no credit, as it was given to me from above.

The whole story of his life and work is indeed a monument to zeal and industry and the success that may attend it when it is intelligently directed.

Like many very successful men Astley Cooper became somewhat self-assertive and arrogant as he grew older, but never offensively so, for his charm of manner was always retained. Some self-assertion can be forgiven him in view of his attainments and as this very self-assertion must have been part of the driving power of his success. Mumford says:

> The ingenuous and childlike self-approval of many a genius is refreshing. Sir Astley Cooper was one of these pleasant persons.

Part of Mumford's opinion is based on Astley Cooper's autobiographical writings when he was over seventy and although some of his comments are vain and naïve it is understandable that he should write so. In fact, it would have been hypocritical if he had denied his success. His egotism was never offensive. Amongst his own assessment of himself the following passages occur:

> Sir Astley Cooper was a good anatomist, but never was a good operator where delicacy was required. He felt too much before he began ever to make a perfect operator.
>
> For the operation of cataract he was quite unfitted by nature.
>
> Quickness of perception was his *forte* for he saw the nature of the disease in an instant, and often gave offence by pouncing at once upon his opinion. The same faculty made his prognosis good.
>
> He was a good anatomist of morbid, as well as of natural structure.
>
> He had an excellent and useful memory. His imagination was vivid, and always *ready* to run away with him if he did not control it.
>
> His principle in practice was *never to suffer anyone who consulted him to quit him without giving them satisfaction on the nature and proper treatment of their disease.*

He was a good listener, a good conversationalist and a good companion. Temperate without being ascetic he enjoyed good company, and during many years of his life enjoyed the friendship and trust of many of the most distinguished men and women of his day. He was intimate with the King and all his chosen ministers. It can be truly said of him that he "walked with kings nor lost the common touch".

What were Astley Cooper's aims in life? The means by which he achieved these aims have been set out above, and in fact he has described them in his own words. We have also in his own words, written after the age of sixty, a summary of what guided him.

> My objects in life have been threefold:
>
> First to learn.
>
> Second to practise, for the purpose of making myself independent, and of being useful to others.
>
> Thirdly, to publish to the world what I have observed, and in that I am constantly occupied.

Bransby Cooper said of him: "A great incentive to his constant exertion was his innate love of independence, both as to wealth and obligation. From a very early period he yearned after this possession, and having, by his talent and industry, acquired it, he never in any way afterwards compromised it."

These words of his nephew are very important for they throw a great deal of light on Astley Cooper's character.

He was passionately fond of his profession and of all that pertained to it. Until he retired from Guy's he was engaged in both the pursuit of his profession, its advancement as well as his own advancement, and in securing the proud position of leader of English surgery which he truly deserved. By sixty he had achieved wealth, rank, honours, a title and an assured position. He seems then to have weighed these in the balance shrewdly against his innate love of his work and determined to devote the rest of his days primarily to this, although his position still kept him busy in a responsible practice. Again in his own words, he devoted himself chiefly to the science of his profession, excepting a few hours in the middle of the day.

That this was not only his intention but also his achievement has been shown by the record of his later researches and publications. Two contemporary tributes add testimony to this.

First there is the occasion of his election as an honorary Fellow of the Royal College of Surgeons of Edinburgh in 1835. In the letter, still preserved in the library of the Royal College of Surgeons of England, announcing the event to him the following passage occurs:

> By this resolution the College are desirous of expressing their sense of the eminent place which you have attained in the profession of surgery, of the valuable observations which you have made in the nature and treatment of disease, of the liberality and urbanity which has marked your intercourse with professional brethren, and particularly of the zeal for the advancement of surgical science, which has so much characterised your whole life, and which, after a long laborious and successful career, seems to be unsatisfied and untired.

Secondly there is the dedication by Colles of Dublin of his greatest work to Astley Cooper in 1837:

> MY DEAR SIR ASTLEY,
>
> Two motives influence me in placing your distinguished name in the front of the book which I now publish. I have the vanity to wish it to be known that I am honoured by your friendship; and I cannot neglect the only opportunity that may ever present itself of paying such tribute as I have to offer, not merely to the highest professional station and celebrity, but to a juster object of admiration—that zeal in the cultivation of science

> which has outlived, in you, all the ordinary incentives to human industry. Enjoying a splendid fortune, and an undisputed precedence, you have nothing further in wealth or eminence to desire. In such circumstances the world can ascribe your unabated ardour and energy in those fields of inquiry, where you have already had such brilliant success, to nothing but the purest love of truth, and the virtuous ambition of promoting the interests of humanity. An example such as you set will always have more admirers than imitators; among the former permit me to claim a high place; and believe me,
>
> My dear Sir Astley,
> With these and every other sentiment,
> of regard and respect,
> Your devoted friend and servant,
> ABRAHAM COLLES.

What finer and more certain tributes can there be than these to the genuineness of Astley Cooper's work and love for his profession?

He has been accused of being "sharp set on worldly matters and of being greedy for money". It is true that he never knew the burden of poverty, but he never idolised riches. Apart from these two evidences to the contrary there are others. South says: "He was not a money-grubber; it is perfectly true that so long as he remained in the City money poured in upon him incessantly and increasingly, but he never either sponged upon his patient nor displaced the practitioner by whom he was called in."

The same accusation of eagerness to make money has been directed against many famous men; often by their less successful or jealous contemporaries. The brilliant and successful man often finds that money comes to him readily and lavishly to the envy of others; although he accepts it as part of his success and achievement it does not follow that he is centred on it nor that he regards it as anything more than counters in the game. We have Bransby Cooper's words that what his uncle aimed for first of all in his struggle both for wealth and position was *independence*.

Sir Benjamin Brodie wrote:

> In reviewing the history of Sir Astley Cooper, the first thing that attracts our notice is the perfect devotion with which he followed the science of his profession from the very beginning to the very end of his career. No other pursuit stood in competition with it; and we cannot

doubt that his zeal was genuine, that he loved it for its own sake, without reference to it as an instrument for amassing a fortune, or acquiring distinction and importance in the world.

It would seem that Astley Cooper was not so successful in his home life as in other things, for he must have been a difficult person to live with. How else can one describe a man who gets up at 6.30 a.m. (except when he was so busy that he rose soon after 4 a.m.), works in his own dissecting-room in the house until breakfast, and then is seen no more until dinner-time when his stay is only long enough for a meal and is followed by further work until midnight or after. This domestic failure was a price paid for his success in surgery and it looks as if he willingly subjugated all else to his fondness for his profession. We really know little of his first wife, but it is certain that she had scant interest in his work, however much affection she had for him as a husband. We know that she would not act as hostess for the parties he held at his house, and after the death of their adopted daughter she left London completely, only keeping house for him at Gadesbridge. Here she seems to have taken every care to make his visits happy at week-ends and holidays, but the fact remains that from 1814 onwards (when he was forty-six) she did not keep house for him in London. In 1818 Mrs. Bransby Cooper took over the management of his town household. At that time Astley Cooper was at the height of his career and it is impossible to overlook the fact that his domestic arrangements were so anomalous at a time when it would ordinarily be expected that his wife would have played an important and valuable part in his daily work and life. His nephew says that Mrs. Cooper never recovered from the grief of the loss of her own child and the later death of her beloved adopted daughter. It may be that this was the main cause of the incomplete harmony, but it cannot alter the fact that Astley Cooper's domestic life was not normal. Perhaps another woman would have tolerated his preoccupation with his work, recognising that he had a talent "which is death to hide", but Mrs. Cooper clearly had but little sympathy or real interest in it.

He was a happy, congenial and affectionate man in the house as we know from his apprentices, and this might have gone far to mitigate his own domestic defections. No further children came after the death of their first child, and the family consisted only of an adopted daughter and an adopted son. Possibly a family of their own might have made things easier for Mrs. Cooper.

This consideration of his home-life may be inaccurate, but it is a necessary appraisal in assessing the man. His interests and activities were essentially outside the home; his practice, his research and his writing were to him in place of a home and a family.

The debt that surgery owes to Astley Cooper for the part he played as a complement to John Hunter has been fully described, and at the same time the character of his genius was discussed. Again we must refer to the observations of a close associate. His nephew Bransby says:

> It must be evident to those who knew the constitution of Astley Cooper's mind that the power of deep philosophical research was not one of its attributes. Had he, therefore, devoted himself either to extending the system of John Hunter, or to founding one more generally acceptable, his labours would, in all probability, have been eventually attended with failure. Close and accurate observation, correct and forcible description, and an unwearied industry in the pursuit of discovery, were his peculiar characteristics.

It is difficult to see Astley Cooper's labours being attended with failure; his attributes would scarcely have allowed this. It seems that Bransby Cooper's long and close association with his uncle rendered it difficult for him to assess his worth correctly, although his admiration and affection were unbounded. "A prophet is not without honour save in his own country." Now, more than one hundred years after his death, Astley Cooper's work still lives, and over the distance of the years we can accord to him that greatness and genius which in his own era was not universally appreciated or recorded.

The richness of his character and attributes and the splendour and sincerity of his work are beyond dispute. Probably nothing could describe him better or serve as a more fitting epitaph than the simple line in the epilogue to Gray's *Elegy*:

Large was his bounty, and his soul sincere.

CHAPTER XX

THE FINAL SCENE

As the years wore on Astley Cooper became tireless in his search for knowledge and in the accumulation of fresh facts and experiences. He insisted that he would die in harness and die in harness he did. Up to the very last, although his health was failing, he continued to do what work he could, preparing his book on malignant disease of the breast, which was unfortunately never to be finished, and seeing and prescribing for patients. Although his health had not been good for years he was convinced that he would live to a great age, and even near the end spoke of plans for future years of work. In 1835, after a false report of his death from apoplexy, he wrote to his nephew:

> My dear Bransby,
>
> I assure you that I am not *dead*, and that the only fit I have had is a fit of hunger, to which disease I have been extremely liable ever since I was born. Indeed, it is my full intention to practise my profession for the next thirteen years; after that time to retire for twenty, and then to be at God's disposal for as many more as He pleases.

The next thirteen years would have taken him to the age of eighty, and although he was doubtless poking sly fun at Bransby it suggests that he had in mind a long life.

At the end of 1840 he began to have grave difficulty in breathing and found climbing stairs a great labour. He still continued to see patients, but before making a visit would send someone first to count the number of stairs leading to the sick-room and if there were too many he would refuse. Just before Christmas he performed an important operation on Lady Jersey, and before he would undertake it insisted that if there were more stairs than led up to his own bedroom the lady must be moved to a lower floor. This operation closed his career as an operating surgeon.

By Christmas his health had deteriorated still further and the difficulty in breathing became so bad that he had to spend day and night in an arm-chair. He spent Christmas with some friends at Westerham but was too ill to return to London until late in January. His nephew was shocked at the change in him when he called to see him on January 24th. Instead of his usual bright and cheerful vigour he sat with his head bent upon his chest and scarcely moved to give a greeting. Dr. Bright and Dr. Chambers came to look after him, and on February 2nd, at his own request, there was a consultation between the two physicians and Aston Key, Tyrrell and Bransby Cooper.

His decline now became progressive, and on February 10th, after a further consultation, he was informed of a change of treatment that was contemplated. "My dear sirs," said Sir Astley, "I am fully convinced of your excellent judgement and of your devotion to me, but your good wishes will not be fulfilled in my case, and you must excuse me, for I will take no more medicine." The old clinician knew that his own end was near, and he put aside his medicines as useless. Two days later, on February 12th, 1841, at the age of seventy-two, he died in the presence of family and friends. His last words were addressed to them: "Good-bye, God bless you!"

In his life Guy's had been so much to him and in his death he did not wish to be parted. At his own request he was buried in the crypt beneath the chapel, lying near to the tomb of Thomas Guy.

A few days after his death a meeting of students decided to erect a tablet to his memory in the chapel. This plan was changed and instead Joseph Towne carved a marble bust which stands on a large plinth bearing a striking relief of three bearers carrying a sick man. This bust is now in the entrance hall of the medical school at Guy's Hospital. Copies of it may be seen at the Royal College of Surgeons and at the Royal Society of Medicine.

At a larger meeting of the profession another fund was started to arrange some form of public recognition of his services to humanity. As a result a statue was erected as a memorial to him in St. Paul's Cathedral, where it stands near the southern entrance. The striking portrait by Sir William Lawrence has already been mentioned, and this hangs in the Council Room of the Royal College of Surgeons.

These memorials we have, but a greater memorial lies in his works and in the story of his life. It is fitting that we should stop and think over all that he achieved and all that he did for the advancement of the science, teaching and practice of surgery. Although his name is a great one, it is doubtful if he has yet been fully accorded all the honour and esteem which is due to him for the excellence and originality of the work that he did for surgery, during fifty years of a life in which he toiled unceasingly and in a manner quite beyond the powers of any ordinary man.

CHAPTER XXI

THE WORK GOES ON; THE ASTLEY COOPER STUDENTSHIP

EVEN after death Astley Cooper did not relinquish his influence to secure further advancement of our knowledge. In the very matter of his own body he saw items for research, and at his own specific request a post-mortem examination was performed. This was done at Guy's Hospital by John Hilton in the presence of Chambers, Bright, Aston Key and Edward Cock; a full report of the examination (again at Sir Astley's own request) appears in the *Guy's Hospital Reports*, *1841*, **6**, 229. He had directed that special attention be paid to four points: a cured oblique inguinal hernia; a cured umbilical hernia; some suspected indications of phthisis in his youth; and an inability to sleep on his left side.

The lung infection in his youth was confirmed (it should be remembered that all his sisters and his youngest brother died of phthisis):

> at the upper and posterior part of the right lung was a small depressed and somewhat contracted surface, about the extent of a sixpence; a section of which exposed a calcareous mass about the size of a small pea.

The umbilical hernia, for which he had for many years worn a piece of cork secured by strapping, showed as a globular projection about the size of a large nut; it receded on pressure, leaving a well-defined rounded aperture in the linea alba, capable of admitting the end of the little finger.

The most important observation was in connection with the cured inguinal hernia; in fact, it is an observation that should be classical, bearing as it does the unimpeachable testimony of the clinical observation of such an authority on hernia as Sir Astley Cooper and being confirmed finally by the distinguished men present at the autopsy.

In his lecture on hernia Sir Astley says:

> When I was sixteen or seventeen years of age, on hearing a lecture in this theatre, I discovered that I was myself the subject of this complaint. As soon as I felt satisfied of this fact, I could attend no more to the lecture.

> I went home, threw myself on the bed with my legs elevated against the bedpost and remained in this position until Mr. Cline returned. I requested to see him the moment he entered. I then told him that I had had a swelling for some time, and after hearing his lecture I was sure that it was a hernia. Mr. Cline laughed and gave me a common truss. I wore it continuously for three years, at the end of which time there was no appearance of the hernia. I would not leave it off, but wore it for two years more, and from that time to this I have never had the least appearance of the complaint. The truss should be worn night and day, if not it cannot produce adhesions of the walls of the sac.

In the post-mortem report it says that he wore a truss from the age of nineteen to twenty-five.

The cure of inguinal hernia in an adult by the prolonged use of a truss is so unusual that one is inclined to doubt the diagnosis. The findings of the autopsy are, however, beyond doubt. A depression existed in the region of the internal abdominal ring on the right side, the bottom of which was firm, irregular and corrugated:

> and upon very careful examination a minute serous canal, not more than a line in breadth when opened, was traced extending from it along the spermatic cord, into the cavity of the tunica vaginalis, being the remains of a congenital inguinal hernia.

The possibility of an error is, therefore, excluded beyond all peradventure, for the evidence is definite that Astley Cooper carried the remains of a true congenital hernia; it cannot even be suggested that the depression at the internal ring was in the nature of an acquired bulge. The occasions for the late inspection of the results of the use of a truss for inguinal hernia in early adult life must be very rare, if indeed they ever occur under such controlled conditions as these. It is, therefore, the more remarkable that such a valuable and interesting piece of information should have emerged. The pity is that Sir Astley Cooper himself could not know of it.

It was his earnest wish that his manner of work should, if possible, continue after him, and to this end he made a most generous bequest, founding the Astley Cooper Prize. He left a capital sum of £4000, 3 per cent stock, the interest from which was to be used in a triennial award of £300 for the best original essay on a selected subject. The prize was open to any member of the profession, whether English or foreign, with the exception of members of the staff of Guy's or St. Thomas's or anyone related to them by blood or affinity. The surgeons and physicians of Guy's Hospital were appointed adjudicators of the prize, and as a recompense for their work in this connection the residue of the interest on the capital sum was to be divided amongst them after the prize of £300 had been paid.

Astley Cooper himself directed what the first six subjects were to be, although he allowed the order to be changed if thought fit. His selection of topics is interesting and shows in what direction his interest still lay.

The subjects enumerated were:

1. The structure and use of the thymus gland.
2. The structure and use of the spleen.
3. The structure and use of the thyroid gland.
4. The structure and use of the capsulae renales.
5. On the state of the blood and the blood-vessels in inflammation, ascertained by experiment, injections, and observations by the microscope.
6. On the cause of coagulation of the blood.

He specifically laid it down that the essay or treatise should be upon some subject in anatomy, physiology or surgery and should contain original experiments and observations which had not been previously published, and that each essay should be illustrated by preparations and by drawings.

The list of the essay subjects and the successful competitors is as follows:

Year	Subject	Successful contributor
1844	The structure and use of the thymus gland	J. Simon
1847	The structure and use of the capsulae renales	J. Halloran
1850	State of the blood and blood-vessels in inflammation	Wharton Jones
1853	Structure and use of the spleen	H. Gray
1856	Cause of the coagulation of the blood	B. W. Richardson
1859	Structure and use of the thyroid gland	Crisp
1862	Anatomy, physiology and pathology of the human pancreas	Crisp
1865	Injuries of the head and their treatment	Jonathan Hutchinson
1868	Disease known as pyaemia	Braidwood

Year	Subject	Successful contributor
1871	Anatomy and physiology of the sympathetic system	No award
1874	Injuries and diseases of the spinal cord	O. J. Hamilton (the only eligible essay)
1877	Anatomy, physiology and pathology of the sympathetic nervous system	G. A. Wood (one essay disqualified)
1880	Cranial nerves	No award
1883	Pathology of osteo-arthritis	Dr. Alexander
1886	Diseases and injuries of the nerves and their surgical treatment	Anthony A. Bowlby
1889	The origin, anatomy, results and treatment of tubercular disease of bones and joints	William Watson Cheyne
1892	The influence of micro-organisms in inflammation	No award
1895	The anatomical distribution of the lymphatic vessels and the physical forces concerned in the movements of the lymph	No award (1 essay disqualified)
1898	The diseases of the joints caused by syphilis and gonorrhoea	(1 essay disqualified)
1901	The physiology of the pancreas	(1 essay disqualified)
1904	The pathology of carcinoma	W. S. Handley
1907	The naked eye and histological anatomy of the spinal cord	No essay
1910	The physiology of digestion, gastric and intestinal	Professor E. H. Starling, F.R.S.
1913	The means by which the coagulation of the blood may be achieved	No essay
1916	The physiology and pathology of the pituitary body	W. Blair Bell
1919	Gunshot wounds of the lungs and pleura	(1 essay disqualified)

Most of these men reached high positions in their profession and it is interesting to note the names of Henry Gray, the anatomist, Sir William Watson Cheyne, Mr. W. Sampson Handley (for his essay on the pathology of carcinoma), Professor E. H. Starling, and Professor W. Blair Bell. Several of the essays have been published in book form.

Unfortunately, in 1919 it became necessary to change the terms of the prize, owing to diminished competition; since 1880 no award had been made on eight occasions. This may have been due to several reasons; first the Jacksonian Prize Essay of the Royal College of Surgeons was of older foundation and already held an assured and distinguished position; secondly the work and expense involved in preparing the essay were not inconsiderable and the risk of failure after devoting so much time and trouble probably deterred many.

By arrangement with the Charity Commissioners the interest from the capital sum (which had now grown by re-investments and non-payment of the prize money to over £6000) was devoted to the payment of a definite yearly salary for an Astley Cooper studentship which is held for three years. The appointment is still made by the physicians and surgeons of Guy's Hospital, after advertisement, and the holder must undertake some definite piece of research work or perform some constructive work in the Gordon Museum; he is also Astley Cooper Assistant to the Curator of the Gordon Museum, a museum which is the successor of the one founded by Astley Cooper himself, and which still contains a number of his original specimens. Although this bequest of Astley Cooper's does not function quite as he intended it, it still ensures that the principles and traditions which he introduced remain alive and encourage others to follow in his steps.

BIBLIOGRAPHY

MONOGRAPHS

1. *The Anatomy and Surgical Treatment of Inguinal and Congenital Hernia.* Part 1, London, 1804. *The Anatomy and Surgical Treatment of Crural and Umbilical Hernia.* Part 2, London, 1807.
    German translation, 1809.
    Second edition (edited by C. Aston Key), London, 1827.
    German edition, 1833.
    American edition, 1844.

2. *A Treatise on Dislocations and Fractures of the Joints.* London, 1822.
    Appendix: "Observations on fractures of the neck and thigh-bone." London, 1823.
    Second edition, 1823.
    Third edition, 1824.
    German translation, 1824.
    American edition, 1825.
    Fourth edition, 1824.
    Fifth edition, 1826.
    Sixth edition, 1829.
    American edition, 1832.
    New edition edited by Bransby B. Cooper, 1842.
    American editions, 1844 and 1851.

3. *Illustrations of Diseases of the Breast.* Part 1, London, 1829.
    (The Library of the Royal College of Surgeons possesses the Author's copy with his additions inserted towards a second edition which was not published.)

4. *Observations on the Structure and Diseases of the Testis.* London, 1830.
    German translation, 1832.
    Second edition, 1841.
    American edition, 1845.

5. *The Anatomy of the Thymus Gland.* London, 1832.
    French translation, 1832.
    American edition, 1845.

6. *On the Anatomy of the Breast.* London, 1840.
    American edition, 1845.

COLLECTED PAPERS

Surgical Essays, by Astley Cooper and Benjamin Travers. Parts 1 and 2, London, 1818–19.
Three editions of Part 1.
Two editions of Part 2.
American edition, 1821.

Volume 1 contains the following by Astley Cooper:
"On dislocations."
"A case of ligature of the aorta."
"On exostosis."

Volume 2 is wholly by Astley Cooper and contains:
"On dislocations" (second paper).
"Fractures of the hip and knee-joint."
"On the encysted tumours."

LECTURES

1. *Outlines of Lectures on Surgery*. London, 1820.
Second edition, 1821.
Third edition, 1822.
American edition, 1823.

2. *The Lectures on the Principles and Practice of Surgery*, with additional notes and cases by Frederick Tyrrell. London, 1824–27. Three volumes.
American edition, 1828.

3. *Lectures on the Principles and Practice of Surgery*. 1829.
Second edition, 1830.
American edition, 1831.
Third edition, 1832.
Fourth edition, 1836.
Another edition, 1836.
Fifth edition, 1837.
Sixth edition, 1839.
American edition, 1839.
German translations, 1837–38–44, 1845, 1856.

COLLECTED WORKS

Oeuvres chirurgicales completes (translated with notes by J. E. Chasaignac et G. Richelot). Paris, 1837.
Italian edition, 1838.

BIBLIOGRAPHY

CONTRIBUTIONS TO PERIODICALS

1788, *Medical Records and Researches*, p. 1. A case of strangulated hernia. (This volume, issued by a private medical association, was reprinted in 1813.)

1798, *Medical Records and Researches*, p. 86. Three instances of obstruction of the thoracic duct.

1800, *Philosophical Transactions of the Royal Society*, 90, 151. Observations on the effects which take place from the destruction of the membrana tympani of the ear.

1801, *Philosophical Transactions of the Royal Society*, 91, 435. Further observations on the effects which take place from the destruction of the membrana tympani of the ear, with an account of an operation for the removal of a particular species of deafness.

1809, *Medico-chirurgical Transactions*, 1, 1. A case of aneurysm of the carotid artery.

(Re-issued 1812 and 1815.)

1809, *Medico-chirurgical Transactions*, 1, 222. Second case of carotid aneurysm.

(Re-issued 1812 and 1815.)

1810, *Medico-chirurgical Transactions*, 2, 251. Dissection of a limb on which the operation for popliteal aneurysm had been performed.

1810, *Medico-chirurgical Transactions*, 2, 324. Some observations on spina bifida.

1813, *Medico-chirurgical Transactions*, 4, 207. History of a case of premature puberty.

1813, *Medico-chirurgical Transactions*, 4, 425. An account of the anastomosis of the arteries at the groin.

1817, *Medico-chirurgical Transactions*, 8, 425. Three cases of calculi removed from the urethra without the use of cutting instruments.

1820, *Medico-chirurgical Transactions*, 11, 349. Account of a case in which numerous calculi were extracted from the urinary bladder without the employment of cutting instruments.

1820, *Medico-chirurgical Transactions*, 11, 440. Case of a large adipose tumour successfully extirpated.

1823, *Medico-chirurgical Transactions*, 12, 235. On the removal of calculi from the female bladder by dilation of the urethra.

1823, *Medico-chirurgical Transactions*, 12, 235. Account of a stone and of a portion of a catheter extracted from the female bladder by a dilator, with an appendix by Thomas Chapman and George Birt.

1823, *Medico-chirurgical Transactions*, 12, 381. Further account of the extraction of calculi from the bladder without the use of any cutting instrument.

1836, *Guy's Hospital Reports,* **1**, 43. Case of femoral aneurysm for which the external iliac artery was tied by Sir Astley Cooper, with an account of the preparation of the limb dissected at the expiration of eighteen years.

1836, *Guy's Hospital Reports,* **1**, 53. Account of the first successful operation performed on the carotid artery for aneurysm in the year 1808, with the post mortem examination in 1821.

1836, *Guy's Hospital Reports,* **1**, 227. An account of the structure of the placenta and imperfect foetuses mentioned in Dr. Hodgkin's letter.

1836, *Guy's Hospital Reports,* **1**, 241. The history of a compound fracture of the patella.

1836, *Guy's Hospital Reports,* **1**, 429. Notes on the structure of the thyroid gland (and Appendix, p. 653).

1836, *Guy's Hospital Reports,* **1**, 457. Some experiments and observations on tying the carotid and vertebral arteries and the pneumo-gastric, phrenic and sympathetic nerves (and Appendix, p. 654).

1837, *Guy's Hospital Reports,* **2**, 311. Discovery of a superior laryngeal ganglion.

1838, *Guy's Hospital Reports,* **3**, 1. On spermatocele or varicocele of the spermatic cord.

1838, *Guy's Hospital Reports,* **3**, 167. Account of a very large calculus passed by a young woman without operation.

1839, *Guy's Hospital Reports,* **4**, 265. On the dislocation of the os humeri upon the dorsum scapulae and upon fractures near the shoulder joint.

1840, *Guy's Hospital Reports,* **5**, 243. Dissection of a supposed hermaphrodite (Supplement to history by Robert Merry).

1841, *Guy's Hospital Reports,* **6**, 229. His last illness and the inspection of his body.

REFERENCES

Brock, R. C. (1945). "Valentine Mott," *Guy's Hosp. Rep.*, 94, 75.

Bulloch, W., Lampitt, L. H., and Bushill, J. H. (1929). *The Preparation of Catgut for Surgical Use*, H.M. Stationery Office.

Colles, A. (1881). *Selected Works*, New Sydenham Society, London.

Cooper, B. (1843). *Life of Sir Astley Cooper*, London.

Cooper's Surgery, Lee's edition (1837), 2; (1843), 3.

Eason, H. L. (1932). "Cooper and Wakley, 1828," *Guy's Hosp. Gaz.*, 46, 381.

Erichsen, J. E. (1877). *The Science and Art of Surgery*, London, 2, 147.

Fox, J. (1833). *Diseases of the Human Teeth*, 3rd edition, London.

Francis, S. W. (1865). *Memoirs of Professor Valentine Mott*, New York.

Garrison, F. H. (1929). *History of Medicine*, Philadelphia and London.

Godlee, R. J. (1921). *Life of Lord Lister*, London.

Gross, S. D. (1868). *Memoirs of Valentine Mott*, New York.

Helferich, R. (1899). *Fractures and Dislocations*, New Sydenham Society.

Horrocks, W. H. (1899). "Life of Sir Astley Cooper," Presidential Address to the Bradford Medico-Chirurgical Society.

Hunter's Works (1835), edited by Palmer, J. F., 1, 48.

Keevil, J. J. (1949). *Brit. J. Surg.*, 37, 92.

Keith, A. (1913). *Brit. med. J.*, 1, 53.

Lawrence, W. (1838). *Treatise on Ruptures*, 5th edition, London.

MacCormac, W. (1893). "Sir Astley Cooper and his Surgical Work," [Bradshaw Lecture.

Matas, R. (1925). *Ann. Surg.*, 81, 457.

Mumford, J. G. (1898). "Sir Astley Cooper, Bart.," *Boston med. & surg. J.*

Paul, F. T. (1895). *Liverpool Med.-Chir. J.*, 29, 374.

—— (1912). *Lancet*, 2, 217.

Pettigrew, T. J. *Medical Portrait Gallery*, Vol. 1, London.

Reid, M. R. (1926). *Arch. Surg.*, 12, 74.

Rowlands, R. P., and Turner, P. (1927). *The Operations of Surgery*, 2, 868.

South, J. F. (1884). *Memorials*, London.

Sprigge, S. S. (1899). *Life and Times of Thomas Wakley.*

Symonds, C. (1921). Hunterian Oration.

—— (1922). "Astley Cooper," *Guy's Hosp. Rep.*, 72, 1 and 129.

Wilks, S., and Bettany, G. T. (1892). *History of Guy's Hospital*, London.

Williamson, G. S. (1925). "The Applied Anatomy and Physiology of the Thyroid Apparatus," *Brit. J. Surg.*, 13, 466.

Winston, G. A. R. (1943). "John Keats and Joshua Waddington, contemporary students at Guy's Hospital," *Guy's Hosp. Rep.*, 92, 101.

INDEX

- Abernethy, John, 26, 32
- Aneurism—
  - cause, 115
  - diagnosis, 116
  - femoral, 54
  - formation, 114
  - Hunterian ligation, 113, 119
  - medical treatment, 118
  - popliteal, 61, 113, 120
  - proximal ligation, 113
  - sex, 114
  - silk ligature, 54
  - size, 113
  - spontaneous cure, 117
  - traumatic, 115
- Antommarchi, 129, 130
- Aorta—
  - coarctation, 56
  - in dog, 56
  - specimens in Gordon Museum, 56
- "Ashley Cooper Set", 40

- Babington, William, 16, 141
- Bell, Sir Charles, 152
- Bettany, G. T.—
  - comment on Astley Cooper, 72
- Bowel—
  - injury of, 125
  - resection and suture, 82
- Breast—
  - anatomy of, 72, 73, 95
  - Cooper's suspensory ligament, 97
  - nipple, 96
  - treatise on Diseases of, 91, 95
- Bright, Richard, 162, 164
- Brodie, Sir Benjamin, 40, 158
- Brussels—
  - Astley Cooper sends assistants to look after wounded after Waterloo, 35

- Callaway, Thomas, 35
- Catgut—
  - Bickersteth—first use in man, 63
  - experiments on dogs on solubility, 62
  - in arterial ligation, 63
  - use of, 60, 61, 63
- Chambers, Dr., 162, 164
- Charles, his butler, 29, 38, 39
- Chopart, 12
- Cline, Henry, 8, 14, 28, 42, 76, 88, 145; Lectures, 6, 9
- Cline, Henry (junior), 28
- Cock, Edward, 11, 54, 135, 164
- Coleman, Edward, 7, 9; Founder of Veterinary College, 9
- Colles, Abram, 74, 157
- Company of Surgeons, 14
- Cooper, Mrs. Astley—
  - adopted daughter, 16
  - birth and death of daughter, 15
  - death of adopted daughter, 33, 34
  - illness and death, 137
- Cooper, Astley—
  - aims in life, 156
  - aristocratic practice, 41
  - Athletae Club, 140
  - baronetcy, 43
  - Broad Street, 28, 39
  - catgut, use of, 60, 63
  - continental tours, 138
  - Cromer, 143
  - demonstrator in anatomy, 9, 13, 14, 17, 22
  - dissection and comparative anatomy, 21, 22, 28
  - distinctions and degrees, 139
  - Edinburgh, 8, 139
  - engagement, 11
  - experiments on animals, 81, 109
  - false report of death, 161
  - first publications, 16
  - Gadesbridge, 34, 141, 142, 143
  - Hunterian Professor in Comparative Anatomy, 32
  - importance of post-mortem examination, 127
  - income, 17, 32, 39
  - independence, 156
  - instruments, 45
  - last operation, 161
  - last words, 162
  - lecturer and teacher, 100, 110, 122
  - lectures, 13, 14, 17, 103, 112, 113
  - letter to bailiff, 142
  - museum and specimens, 121, 124
- Cooper, Astley, *continued*—
  - myringotomy, 23
  - New Street, 34
  - operation on George IV, 42
  - perfect professor, 109
  - personal appearance, 21, 29
  - political activities, 18, 19
  - post-mortem examination, 164
  - Pow-Wow Club, 140
  - practice, 41
  - President of the Royal College of Surgeons, 131, 137
  - prize, 165
  - pupils, 35
  - resignation from St. Thomas's, 112
  - "resurrections", 22, 127
  - Royal Society, 23, 24
  - second marriage, 138
  - Sergeant-Surgeon, 43
  - statue in St. Paul's cathedral, 162
  - suspensory ligament, 97
  - vertigo, 34, 46, 111
  - wedding, 11
- Cooper, Mrs. Bransby, 35
- Cooper, Bransby, 18, 20, 28, 29, 45, 132, 133, 135, 156
  - biography of Astley Cooper, 22
  - law-suit, 136
- Cooper, Henry, 35
- Cooper, William, 3, 4, 14; resignation from Guy's Hospital, 20

- Danton, 12
- Dental Surgery, 101; Joseph Fox, 102
- Dessault, 12
- Dupuytren, 83, 138; visit to Guy's Hospital, 153

- Eason, Sir Herbert, account of Bransby Cooper's lawsuit, 136
- Eckhoff, Nils, 66
- Edinburgh—
  - Honorary F.R.C.S., 139
  - Honorary LL.D., 139
  - visit to, 8

Femur—
  blood supply, 90
  fracture of neck of, 89
Fox, Joseph, Lecturer in Dental Surgery at Guy's Hospital, 102
Fractures and dislocations, 36, 73
  amputation for compound fracture, 87
  blood supply, 89, 90
  femur, 89
  Helferich, 88
  hip-joint, 46, 86
  non-union, 89, 90
  shoulder, 88
French National Assembly, 12

Galen, catgut, use of, 63
George IV, 41, 43; operation on, 42
Gimbernat's ligament, 85
Gordon Museum, 54
  abdominal aorta in dogs, 56
  Astley Cooper's specimens, 54, 125
Guy's Hospital—
  Astley Cooper's appointment as surgeon, 19
  centenary of foundation, 134
  Dental School, 102
  Medical School foundation, 133
  Museum of Antiquities, 28, 66
  Physical Society, 5, 7, 8
  Wills Library, 84
Guy's Hospital Reports, 49
  account of Astley Coopers' amputation at hip-joint by Eckhoff, 66
  first number, 53
  special (1941) number on centenary of Astley Cooper's death, 49

Haighton, John, 6, 9, 16
Harrison (Treasurer of Guy's Hospital), 17, 18, 19, 91, 133
Hernia—
  anastomosis, 83
  anatomy, 74
  Astley Cooper's ligament, 76
  bleeding, 78
  deep epigastric artery, 80
  Dupuytren's enterotome, 83
  experiments on dogs, 81
  fascia transversalis, 74, 75, 76, 77
  femoral, 74, 77, 85
  femoral sheath, 77
  gangrene, 80, 81, 83
Hernia, *continued*—
  Gimbernat's ligament, 85
  inguinal, 25, 165
  internal abdominal ring, 74, 75, 79
  linea alba, 79
  obturator, 124
  Paul and Miculicz, 83
  reduction *en masse*, 78
  resection of bowel, 82
  sac, 77
  strangulated, 74, 77, 79, 85
  taxis, 78
  tobacco enema, 78
  treatise on, 73
  truss, 84, 165
  very large, 84
Hilton, John, post-mortem examination of Astley Cooper, 164
Hip-joint—
  account by Eckhoff, 66
  amputation at, 66
  amputation through trochanter major, 71
Hunter, John, 4, 49, 109, 110, 145, 146
  collection of specimens, 121
  failure in practice, 149
  lectures, 7, 9, 102
  method of proximal ligation of aneurism, 113, 119
  Pow-Wow Club, 140
  Royal Society, 24
Hydrocele—
  injection, 92
  Mr. Gibbon's, 92

Johns Hopkins Hospital, cases of aneurysm, 59

Keats, John—
  Endymion, 104
  lodgings, 104
  notebook, 104
Keith, Sir Arthur, 128
Key, Aston, 35, 54, 57, 133, 136, 164
  Second edition of *Hernia*, 74
  Surgical lectures, 132

Lancet, 68, 69, 103, 104, 105, 107
Lawrence, Sir Thomas, painting of Sir Astley Cooper, 151
Lawrence, Sir William—
  ruptures, 74
  transversalis fascia, 74
Lettsom, John, 141
Lewis (assistant to Astley Cooper), 122
Ligation—
  aorta, 26, 36, 46, 55, 60, 125
  carotid artery, 26, 50, 52
  experiments on dogs, 49
  external iliac artery, 54, 125
  followed by secondary haemorrhage, 54
  subclavian artery, 54
  temporary ligation, 54
Lister, Lord—
  experiments on catgut, 61
  Godlee's Life of, 60
  use of sterilised catgut, 60
Love, John, 2
Lovick, Samuel, 35

Marat, 12
Matas, Rudolph, 60
Medical Education, Committee on, 123
Medical Records and Researches—
  Astley Cooper's first publications, 16, 72
  Editors, Haighton and Babington, 16
Medical Society of London, 26
Medico-Chirurgical Society, 27, 51
Menagerie at the Tower, 22
Monro (Secundus), 8
Mott, Valentine—
  American pioneer in arterial surgery, 64
  first ligation of innominate artery, 64
  first successful ligation of common iliac artery, 64
  pupil of Astley Cooper, 64

Napoleon—
  Antommarchi, 129, 130
  Barry O'Meara, 128, 129, 130
  death, 129
  intestine, 128
Norwich Hospital, visit to, 153

Old Bailey, 15
O'Meara, Barry, 128, 129, 130
Osler, Edward, 57; eye-witness account of ligation of aorta, 58
Osler, Sir William, gift of letter from Edward Osler, 57

INDEX

Paris—
  Chopart, 12, 153
  Danton, 12
  Desmaret, 153
  Dessault, 12
  Dubois, 153
  Dupuytren, 83, 138
  French National Assembly, 12
  Larrey, 153
  Marat, 12
  Robespierre, 12
  September massacres, 12
  visit to, 12
Pettigrew, Henry, *Medical Portrait Gallery*, 44, 111
Physical Society—
  Guy's Hospital Physical Society, 5, 7, 8
  Pupils' Physical Society, 5
Physick, Philip Syng, use of catgut, 63
Publications, *see* Bibliography

"Resurrection" men, 22, 127
Robespierre, 12
Roots, William (dresser), 20, 44
Royal College of Surgeons, 130
  Astley Cooper, Hunterian Professor in Comparative Anatomy, 32
  Astley Cooper made examiner, 131
  Astley Cooper, President, 131, 137
  bust of Astley Cooper, 162
  Napoleon's intestine, 128
Royal College of Surgeons, *continued*—
  manuscript copies of catalogue of Astley Cooper's specimens, 125
Royal Medical Society of Edinburgh, 8
Royal Society, 23
  Astley Cooper election as Fellow, 24
  Astley Cooper, Vice-President, 138
  Copley Medal, 24
  John Hunter, 24

St. Thomas's Hospital, 17, 30
  Museum, 33, 52, 59
  Travers, Benjamin, 21
South, Flint, 29, 103, 104
Sprigge, biography of Wakley, 105, 106, 107
Student's note-book, 101
  Joshua Waddington, 104
  Keats, 104
Surgeons' Hall, Lectures in Anatomy, 14, 17
Symes, Professor James, 68, 69
Symonds, Sir Chartres, 98, 150

Testis, 91
  illustrated specimens, 124
  ligation of vas, 91
  syphilis of, 92
  tuberculous disease of, 92
Thymus gland
  foetal calf, 93
  lymphatic vessels, 93
Thymus gland, *continued*—
  thymic secretion, 93
  Williamson, Arris and Gale Lecture, 94
Thyroid gland, 93; secondary deposits of carcinoma, 95
Towne, Joseph—
  marble bust of Sir Astley Cooper, 162
  modeller to Guy's Hospital, 123
  wax skeleton, 123
Travers, Benjamin, 21, 36, 58, 151
Tyrrell, 35, 108, 136

United Hospitals, 4, 36, 100, 105
  Astley Cooper as Lecturer, 17
  resignation as Lecturer, 132
  separation, 59

Veterinary College, 9

Waddington, Joshua, Note-book 104
Wakley, Thomas—
  exclusion from lectures, 135
  founder of the *Lancet*, 134
  libel action, 105, 136
  publication of lectures, 105, 106, 107
Wellington, Duke of, patient and friend, 41
Williamson, Arris and Gale Lecture, 94